DOCUMENT RESUME

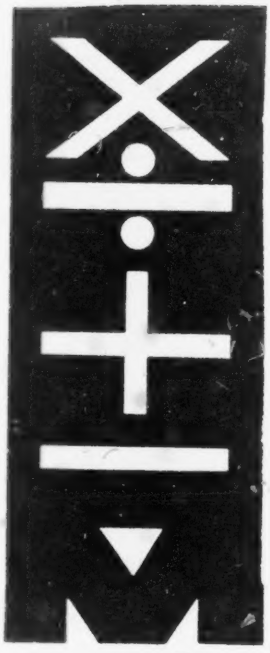
ED 069 469 SE 014 567

TITLE	Basic Mathematics Machine Calculator Course.
INSTITUTION	Windsor Public Schools, Conn.
PUB DATE	69
NOTE	533p.
EDRS PRICE	MF-$0.65 HC-$19.74
DESCRIPTORS	*Algorithms; Grade 10; Instruction; *Instructional Materials; Laboratory Procedures; Mathematical Applications; Mathematics Materials; Practical Mathematics; Problem Solving; *Secondary School Mathematics; *Workbooks
IDENTIFIERS	Desk Calculators; *General Mathematics

ABSTRACT

This series of four text-workbooks was designed for tenth grade mathematics students who have exhibited lack of problem-solving skills. Electric desk calculators are to be used with the text. In the first five chapters of the series, students learn how to use the machine while reviewing basic operations with whole numbers, decimals, fractions, and percents. The rest of the chapters present word problems in simple consumer mathematics, business activities, installment buying, banking, stocks and bonds, insurance, taxes, and utilities. A chapter on the use of formulas is included. (DT)

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION



BASIC MATHEMATICS
machine calculator course

a text-workbook
BOOK 1

1969

revised

FILMED FROM BEST AVAILABLE COPY

Windsor Public Schools

FORWORD

The machine calculator course, originally introduced for tenth grade mathematics students in September of 1966, has undergone an ambitious revision conducted by a mathematics research and development team under the ESEA, Title I, grant. Under the direction of G. William Saxton, Director of Secondary Education, Hartford Board of Education, the course materials have been developed by the following team members: Stephen J. Ucich, chairman of the team, department of mathematics, Hartford Public High School; Robert C. Mogensen, department of mathematics, Hartford Public High School; Marie M. Gubitz, department of mathematics, Weaver High School; William R. Johnson, chairman, department of mathematics, Windsor High School.

The course is intended to meet the needs of students who have exhibited a lack of problem-solving skills. Employing electric desk calculators to rid students of the frustration of computational drudgery, a new learning setting in which students can succeed has released them to read and analyze problems to a greater extent. These problems are directly related to the world of work that these students may enter upon graduation.

The efforts of the first curriculum team in the summer of 1966 were directed toward authentic, practical, problems obtained from business and industry in the greater Hartford area. With a year of valuable experience as a guide, the team has reorganized the course content from its originally exclusive problem-solving approach to a text-workbook format.

It was felt that students needed a basic review of arithmetic skills before they attempted to solve problems. In the first four chapters students learn how to use the machine while reviewing the basic operations with whole numbers, decimal numbers, fractions, and per cents. Next, a transitional chapter stresses the combining of these operations, so necessary for the solution of the detailed problems that follow.

In chapters 6 and 7 students first encounter problems that are within the framework of their own experience and are then gradually introduced to the more simple business oriented applications.

Chapters 8, 9, and 10 deal with the use of formulas and measurement of plane surfaces and solid figures, preparing students to extend this knowledge into the mathematics of everyday living and the more difficult practical problems from business and industry.

The intent of this order of course materials is to allow students to move toward independent achievment with greater confidence in solving problems that are new to them, thus creating the realistic atmosphere of the business world.

The objectives of the course are to be evaluated by pre-test and post-test scores on a mathematics achievment test designed by the team. The results should indicate the direction of possible future revisions to insure that educational offerings in mathematics are continually updated to meet the needs of our youth.

Looking ahead, the possibility of extending machine oriented mathematics courses to students in other grades certainly should not be discounted. Research in this field may reveal a need to offer the college bound student, as well as the student who will immediately enter the labor market, an opportunity to pursue mathematics for a deeper and more meaningful understanding of its principles.

Lloyd Calvert

Lloyd Calvert
Superintendent of Schools
Windsor, Connecticut

August, 1967

FORWORD

1968, Revised Edition.

The important features of this edition include the addition of an introduction to flowcharting in Chapters I and II and a complete revision of that portion of Chapter II dealing with division of decimals. Optional problems were also added to stimulate student interest.

The following members of the Windsor High School Mathematics Department worked as a team during a workshop on May 22, 1968, to provide much of the material for the revision of Chapter II: Mrs. Joanne Goetz, chairman; Miss Carol Burbeck; Mr. Donald Cunningham; Mr. Richard Jepsen; Mrs. Sylvia Koehler.

William R. Johnson

William R. Johnson
Chairman, Mathematics Dept.
Windsor High School

August, 1968.

TABLE OF CONTENTS

CHAPTER I - Using the Machine Calculator Page

1-1 Normal Position of Keys 1
1-2 Addition of Whole Numbers 2
1-3 Flowcharting 5
1-4 Flowcharting Addition 8
1-5 Checking Answers in Addition 10
1-6 The Column Indicator 10
1-7 The Clear Key 11
1-8 The Back-Space Key 12
1-9 Subtraction of Whole Numbers 12
1-10 Reversing the Order of Subtracting Numbers 14
1-11 Cancelling a Wrong Entry 15
1-12 Multiplication of Whole Numbers 16
1-13 Division of Whole Numbers 18
1-14 Review Exercises 22

CHAPTER II - Decimals

2-1 Addition of Decimals 27
2-2 Adding Zeros to Numbers to Keep Decimal Points in Line ... 28
2-3 Horizontal Addition of Decimals 29
2-4 Subtraction of Decimals 30
2-5 Multiplication of Decimals 31
2-6 Locating Decimal Point Directly on Tape 32
2-7 Multiplication by 10, 100, or 1000 33
2-8 Multiplication by .1, .01, .001 34
2-9 Division 35

CHAPTER II - Decimals (Cont.)

2-10 Location of Decimal Point Directly on the Tape............ 36

2-11 Division Problems Requiring Insertion of Zeros 37

2-12 Division of Decimal by a Whole Number--Placing Zero....... 39

2-13 Rounding Off Numbers 40a

2-14 Rounding Off Quotients by Use of the Remainder 41a

2-15 Rounding off Quotients 43a

2-16 Review 44a

CHAPTER III - Fractions

3-1 Locating the Decimal Point In An Indicated Division 40

3-2 Changing Proper Fractions to Decimals 42

3-3 Changing Improper Fractions to Decimals 43

3-4 Mixed Numbers 45

3-5 Changing Mixed Numbers to Improper Fractions 47

3-6 Multiplying With Fractions 49

3-7 Repeating Decimals and Terminating Decimals 51

3-8 Review Exercises 58

CHAPTER IV - Per Cent

4-1 Meaning of Per Cent 61

4-2 Finding the Per Cent of a Number 65

4-3 Per Cents Greater Than 100% 66

4-4 Fractions of a Per Cent 67

4-5 Per Cents With Common Fractional Equivalents 70

4-6 Changing Fractions and Decimals to Per Cents 72

4-7 Finding What Per Cent One Number Is of Another 74

4-8 Review Exercises 75

Introduction to the Student

"Machines in a math class" - whoever heard of such an idea? What is the purpose of using a machine in mathematics?

First, you should understand that the important thing in this math class is you - not the machine. It is not the purpose of this course to have you learn how to become a machine operator. This is a high school math course - not a business training course. The purpose of this course is to present you with an opportunity to increase your mathematical ability - the machine is to be used only to help you with your arithmetic.

Luckily, the machine never gets tired. It is at your service to do all the long and tiresome computations that you remember doing in your past math classes. That is its only purpose. However, you must still do the thinking for the machine. The following problem will help to illustrate this:

If there were 789 jars each containing 3,456,789 beans, how many beans would there be altogether?

First think of how you are going to do the problem. After you have done the thinking, you are ready to calculate.

Next, take a piece of scrap paper and get ready to do the arithmetic. Your teacher will tell you when to start. When you are through, raise your hand to show that you have the answer.

When your teacher tells you to, turn to the bottom of page 24 for the answer.

Take a guess as to how long you think it would take to do this same problem on your machine? Turn to the bottom of page 45a for the answer.

The purpose of doing this example is to show that you can get an accurate answer in a matter of seconds using a machine, but that the answer is no better than the thinking you did in deciding how to do the problem. Therefore, in this course you will spend a great deal of time reading, thinking, and planning out a very short time in calculating. You are going to find that mathematics is enjoyable when you have a machine to help you with your arithmetic problems.

There are many problems in this course that normally would not be included in a math course because they are too long and detailed. The problems in the first part of the book are ones that you may recognize from your own experience. Later in the text you will tackle problems that are taken directly from business establishments in the greater Hartford area. After you graduate from high school, you may meet these problems again when you work - you may even use this same machine to perform calculations. These are real problems - problems that will require a high degree of concentration because of their special language and the combinations of operations that are required to solve them. They were obtained by a group of teachers under the direction of the Hartford Board of Education and written into the text through a combined effort of Hartford and Windsor high school teachers.

This is a text - workbook. It is yours to keep. You will be doing most of your work in the text itself. At times you will be asked to do your classwork and homework using pencil and paper and to then check your work on the machine.

It is hoped that this combination of pencil work and machine work will increase your ability to solve problems and to help you gain a better understanding of the principles of mathematics.

Chapter I

USING THE MACHINE CALCULATOR

Machine Operation and Classroom Procedure

1. Follow directions carefully. Do not try to do things with the machine unless the directions tell you to do so. Do not experiment with the machine.

2. This machine can be jammed if the wrong keys are punched. If the machine is jammed it cannot be used until a repair man fixes it.

3. Always be sure your keys are in their NORMAL position. If they are not, your machine will not give correct answers, or may not give answers at all. NORMAL position of keys will be explained in chapter one.

4. Follow this procedure when learning how to use the machine:
   a) Read the entire paragraph first, but do not do any work on the machine.
   b) Read the paragraph again and this time perform the work of the paragraph on the machine.
   c) Ask your teacher for help if you do not understand the explanations.

5. Do not open the top of the machine.

6. Your teacher will show you how to tear off the tape and also how to advance the tape.

7. If your machine runs out of tape, ask your teacher to put in a new roll. Later in the course you will be allowed to replace your own tape.

8. If you tear off any tape during the period or at the end of the period, be sure to throw it in the baskets. Do not leave tape inside the desk, under the machine, or on the floor. Everyone likes to work in a clean, business-like atmosphere.

9. Never write on the machine. This is a serious offense.

10. Do not walk in between the rows of desks where the electrical cords are plugged in. You may hurt yourself if you trip over the cords.

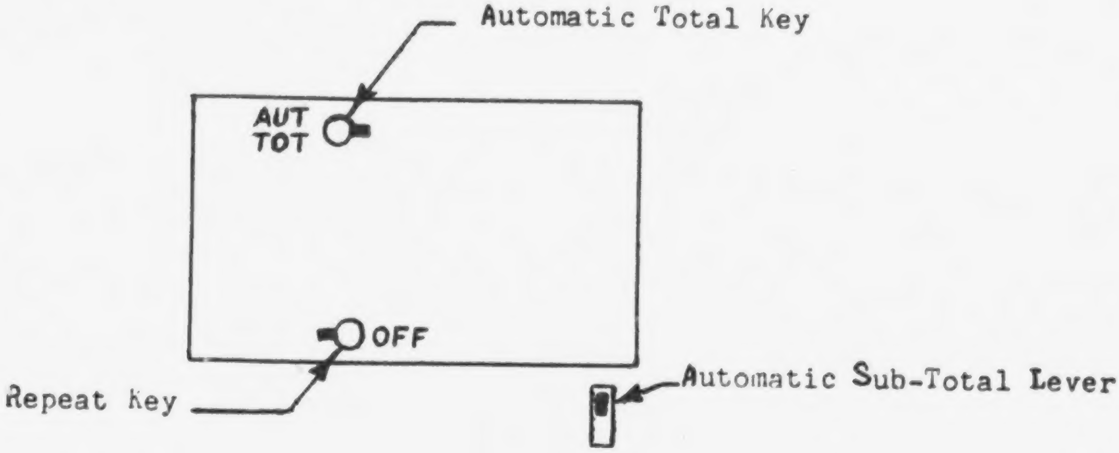
11. If a cord is pulled out of the floor plug, do not put it back in. The prongs may have become bent, and if you try to insert the prongs you may receive a serious shock. Ask your teacher to fix the prongs. Teachers are shock-proof.

12. You may adjust the position of the machine on your desk. If you do, be careful not to get the machine too close to the edge of the desk.

CHAPTER 1
Using The Machine Calculator

1-1 Normal Position of Keys

Below is a picture of the keyboard. On the keyboard there are three (3) keys that you must set before you use the machine. When you come into class each day, the first thing you must do is to make sure that these keys are set correctly. If they are not set correctly you will not get correct answers when you use the machine.



The three keys are shown in their NORMAL positions. If they are not set like this now, you must put them in their normal positions. Once these keys are set you do not have to re-set them. They will stay in these positions as long as you do not move them.

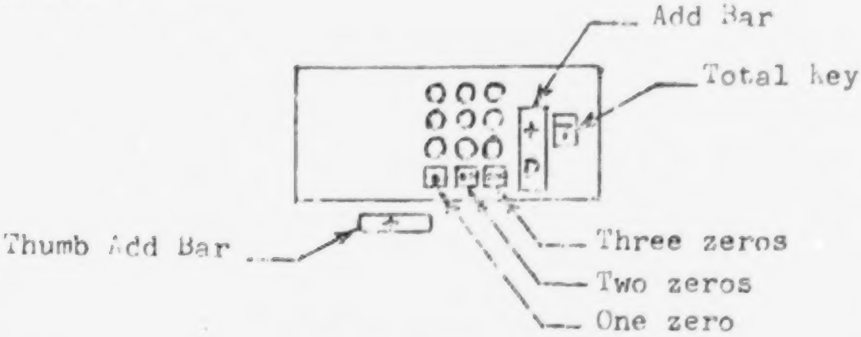
To move the Automatic Total Key, just move it to the left or right. The same is true for the Repeat Key.

To move the Automatic Sub-Total Lever, press it down and lower it. To return the Automatic Sub-Total Lever to its NORMAL position, press it down and raise it.

Set your keys to NORMAL position now.

1-2 Addition of Whole Numbers

This is a picture of the keys that you will use to add numbers.



Before you begin, are your keys in their NORMAL positions? Look at page 1 if you are not sure.

The next thing you must do is to CLEAR THE MACHINE Someone may have been using this machine before you. There may be some numbers left over in the machine. You must clear out these numbers by punching the Total Key, $\boxed{T}$. Punch $\boxed{T}$ now.

Be sure to PUNCH the Total Key. Do not press it or else it will just stay down. PUNCH it with a quick jab of the finger. The Total Key will come back up after you have punched it.

Example 1: Add 8 and 3

Solution:

a) Punch the number 8.

b) Punch the Add Bar. This tells the machine that you want to Add 8.

c) Punch the number 3.

d) Punch the Add Bar. This tells the machine that you want to Add 3 to the 8.

e) Punch the Total Key. Read your answer,11, on the tape.

Your answer should look like this:

```
 8 +
 3 +
11 T
```

When adding numbers you may use the Add Bar or the <u>Thumb Add Bar</u>. Both bars do the same thing in addition problems. Find the Thumb Add Bar on page 2.

Example 2: Add 42 and 10

Solution:

a) First clear your machine by punching $\boxed{T}$.

b) Punch 4, then punch 2. This is the number 42.

c) Punch the Add Bar.

d) Punch 1, then punch one zero.

e) Punch the Add Bar.

f) Punch the Total Key. The answer is:

```
    T
42  +
10  +
52  T
```

The letter T after 52 means <u>Total</u>. It <u>also</u> means that your machine is <u>cleared</u>. There are no other numbers left over in the machine.

If your tape reads 52 T then you may do Example 3. If your tape does <u>not</u> read 52 T, do the problem over again.

Example 3: Add 503 and 240

Solution:

a) Punch 503 and then punch the Add Bar.

b) Punch 240 and then punch the Add Bar.

c) Punch $\boxed{T}$. The answer is 743 T.

```
503 +
240 +
743 T
```

If your answer does not read 743 T then you must do the problem over again.

Example 4: Add 9006 and 4000.

Solution:

a) Punch 9, then two zeros, then 6. Punch the Add Bar. Notice that you could punch $\boxed{0}$ two times, or you could have punched $\boxed{00}$ only once.

b) Punch 4 and three of these $\boxed{0}$, or punch 4 and one of these $\boxed{000}$. Punch the Add Bar.

c) Punch $\boxed{T}$ The answer is 13006 T.

Notice that the machine does not print a comma between the 3 and the zero in the number 13006. If you want to put in commas on your tape, you may do so with your pencil. This may help you to read the number. Remember, for whole numbers you put in commas for every group of three digits as you count from right to left. This number would then be written as 13,006.

Example 5: Add, 3047 + 6300 + 9803 + 5000.

Solution:

a) Punch 3047 and the Add Bar.

b) " 6300 " " " ".

c) " 9803 " " " ".

d) " 5000 " " " ".

e) Punch $\boxed{T}$ The answer is 24,150. The comma has been put in after the first group of three digits. The answer is read as "twenty four thousand, one hundred fifty."

1-2 EXERCISES: Find the sums in the following problems.
Write your answers on this page.

```
 1.   8     2.  10     3.  15     4.   7     5.  13     6.   8
      4          9         11         18          9         15

 7.  21     8.  40     9.  25    10.  66    11.  51    12.  70
     33         13         44         20         23         19

13.  13    14.  62    15.  21    16.  78    17.  89    18.  22
      9         40         33         80         90         30
     27          9         76         12         65         76
     30         80         67         21         66          3

19.  347      20.  200      21.   72     22.  1673    23.  7000
     209            84           100          3000          802
      43           107            39            84         2007
     700             9            93          4600           39
      98            36           470           170         4000
```

24. 12 + 30 + 5 + 19 + 6 + 38 + 4 + 65 + 29 = _____ Answer

25. 398 + 5070 + 4409 + 603 + 500 + 8340 = _____ Answer

1-3 Flowcharting

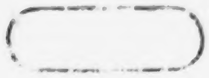
A flowchart is a pictorial outline of a series of steps to be performed on a machine to solve a problem. The machine may be a desk calculator such as you are using, or it may be a high speed digital computer such as is used in business and industry.

Each flowchart contains certain standard symbols with a brief explanation written inside the symbol to explain the step to be performed. The symbol and the explanation present a clear, visual instruction of how to solve a given problem.

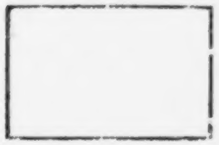
Some advantages of flowcharting are:

1. Prevents wasted time, by knowing what is to be done and pre-planning how to do it.
2. Reduces complicated mathematical problems to more easily understandable sections.
3. Assures understanding. If a problem cannot be flowcharted, it is not understood.
4. Provides a means of communication between persons working on the same problem.
5. Enables a job to be done in sections. This is helpful if you have to stop at some point in a problem and finish it at some other time.

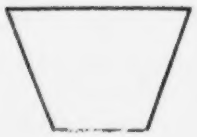
Symbols used in flowcharting:



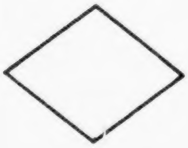
TERMINAL: Marks the beginning and the ending of the problem.



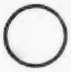
OPERATION: Instuctions to perform a certain operation.



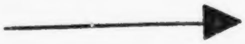
PRINTED OUTPUT: Item or answer printed on machine tape.



DECISION: Used where a decision has to be made.

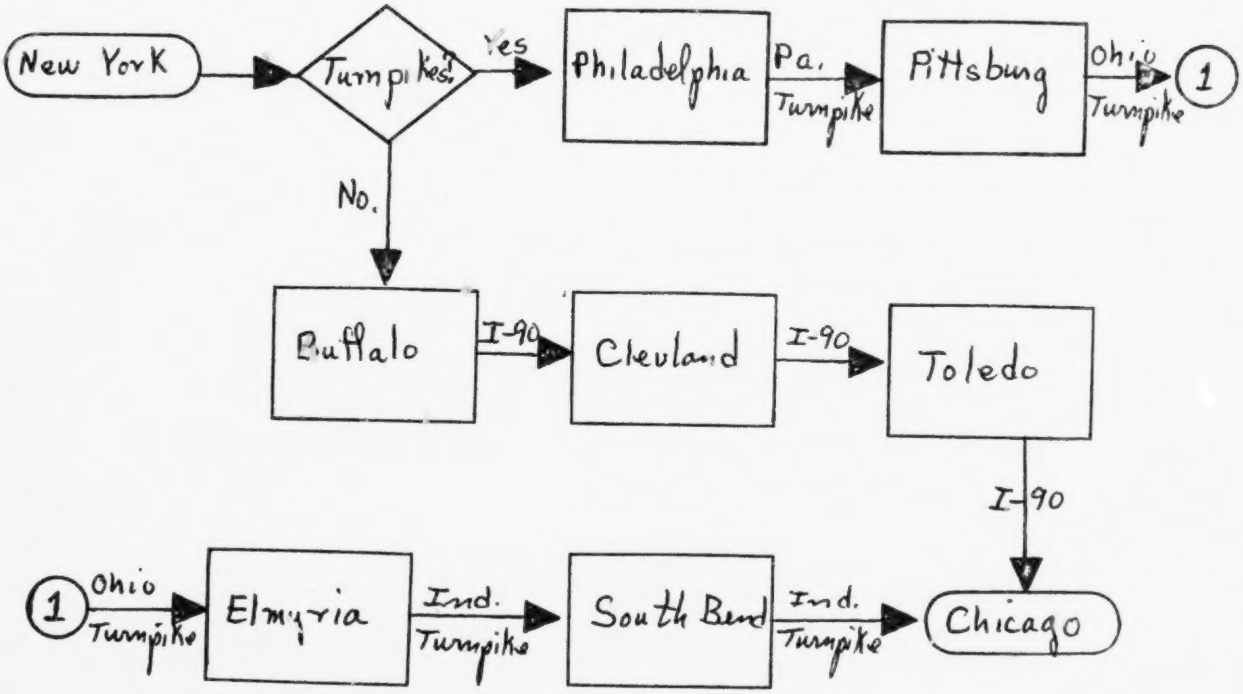


CONNECTOR: Used to identify exit from or entry into different parts of a program.



FLOW: Used to show direction to the next step.

Sample flowchart:
Flowchart of Trip from New York to Chicago


New York
Turnpikes?
Yes
Philadelphia
Pa. Turnpike
Pittsburg
Ohio Turnpike
1
No.
Buffalo
I-90
Clevland
I-90
Toledo
I-90
1
Ohio Turnpike
Elmyria
Ind. Turnpike
South Bend
Ind. Turnpike
Chicago

Note the following about the flowchart on page 7:

1. The flowchart has a title.
2. The symbols have writing in them.
3. The connectors are numbered.
4. The arrow heads show the direction of flow.
5. The beginning, New York, and the end, Chicago, are marked by terminals.

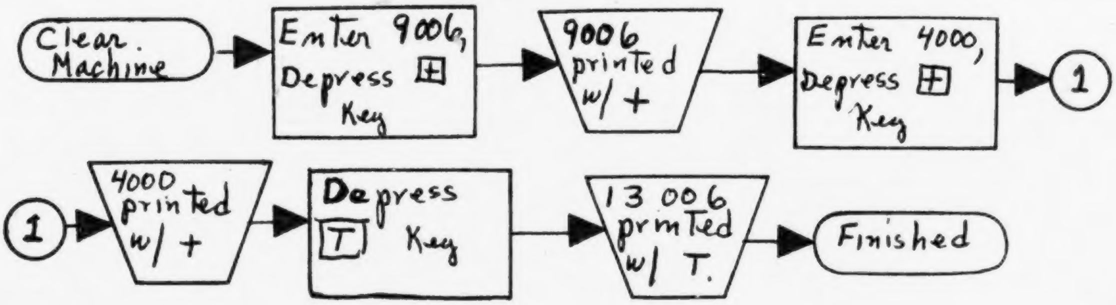
1-3 EXERCISES: Flowchart the following:

1. How I get to school in the morning.
2. What do we do in our class on Mondays.
3. How I do my homework.
4. Planting a flower.
5. Catching a fish.
6. How to set your hair.
7. How to change a tire.
8. How to bake a cake.
9. Making pancakes.
10. Parking a car in a tight space.

1-4 Flowcharting Addition

Let us now go back to page 4 and make a flowchart for example 4.

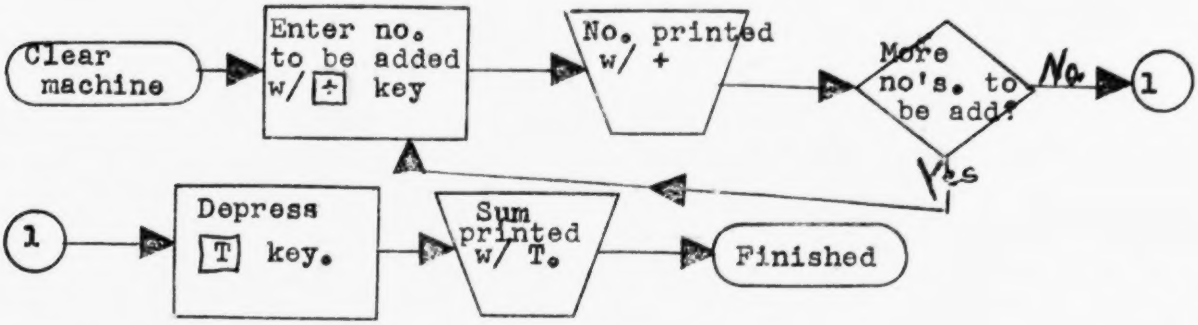
Add 9006 and 4000


Clear Machine
Enter 9006, Depress ⊞ Key
9006 printed w/ +
Enter 4000, Depress ⊞ Key
1
1
4000 printed w/ +
Depress T Key
13 006 printed w/ T.
Finished

1-4 A EXERCISES: Flowchart the following addition problems:

1. 756 + 592 =   2. 1005 + 25 + 3892 =

FLOWCHART FOR ADDITION OF WHOLE NUMBERS


Clear machine
Enter no. to be added w/ + key
No. printed w/ +
More no's. to be add?
No
1
Yes
1
Depress T key.
Sum printed w/ T.
Finished

Note:

1. Unless stated otherwise, keyboard should always be in NORMAL position.

2. The use of a DECISION step in the above flowchart.

1-4 B EXERCISES: Make a copy of the above flowchart and use it to do the following.

1.		2.	
	59672		9735
	27635		6684
	58936		9876
	24359		2456

3. 302 + 590 + 298 =

4. 527 + 51 + 3526 + 9327 =

5. 84695 + 29654 + 972732 + 444444 =

1-5 Checking Answers in Addition

If you want to check an addition problem, you do <u>not</u> have to do the problem all over again. Just check your <u>tape</u>. Your answer will be correct if your tape shows:

a) that you have punched the correct numbers, and

b) that a plus sign (+) is to the right of each number.

Example: Add, 320 + 409 + 377 + 500 + 691.

Solution:

The tape should look like this:

```
     T
 320 +
 409 +
 377 +
 500 +
 691 +
2297 T
```

a. Has each number been punched correctly?

b. Is there a + sign after each number? The answer <u>must</u> be correct. You do not have to do the problem over again to check your answer.

<u>IMPORTANT REMINDER:</u>

How can you tell that the machine was cleared before the problem was started? If it were not cleared, would the answer be correct?

1-6 The Column Indicator

The Column Indicator is located above the number 7 on the keyboard. It is behind the plastic window.

The Column Indicator shows how many <u>digits</u> you have punched into the machine. (The <u>digits</u> in our number system are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.)

For instance, if you wanted to punch the number 456 into the machine, you would first punch 4. Punch in 4 now. Do you see that a red number has appeared in the column indicator. This red number shows that a "*one digit number*" has been punched.

Now punch in the number 5. The column indicator shows that a "*two digit number*" has been punched.

Now punch in the number 6. The column indicator shows that a "*three digit number*" has been punched.

The column indicator is a reminder of how many digits you have punched.

Example 1: Punch in the ten digit number 3,149,000,000.

When you are all through punching in this number, what does the column indicator show? It shows the red number "0." This means a 10 digit number has been entered into the machine.

Example 2: Punch in any *twelve* digit number.

The column indicator shows the red number "2." This means a 12 digit number.

This machine cannot *print* a number that has more than twelve digits. However, later you will find that the machine can print an *answer* that has 13 digits.

1-7 The Clear Key

Suppose you wanted to punch in the number 798 but *instead* you punched in 789. You can clear this number out of the machine by punching the Clear Key. Since you have now cleared out the mistake, you can punch in the right number.

Punch in *any* number, large or small, and then clear it by punching the Clear Key. Do this now.

How do you know for sure that the number has been cleared? You can find out by punching the Add Key. For example:

a) Punch in the number 456.

b) Clear it.

c) Punch the Add Key.

Was the number printed on the tape? The tape shows that the number was cleared out and was not printed.

Does the column indicator also show that the number was cleared? Do the example over again and see.

1-8 The Back-Space Key

The Back-Space Key is located just above the Clear Key. It has a white arrow on it.

Suppose you wanted to punch the number 1002, but instead you punched 1005. If you punched the clear key, the entire number 1005 would be cleared. If you punch the Back-Space Key once, only the 5 will be cleared.

The machine now has the number 100 in it. All you have to do is to punch in 2. Check this now by punching the Add Key. Your tape should read 1002.

If you are not sure that you have back-spaced correctly, the easiest way to clear your error is to clear the entire number by punching the Clear Key.

1-9 Subtraction of Whole Numbers

Find the subtraction key on your machine. It is a red key.

Look at the following examples. See if you can decide how to subtract one number from another.

1.	2.	3.	4.	5.
7 +	18 +	24 +	38 +	100 +
5 -	8 -	3 -	8 -	10 -
2 T	10 T	21 T	30 T	90 T

Example 1 is done like this:

a) Punch 7 and then the Add Key.

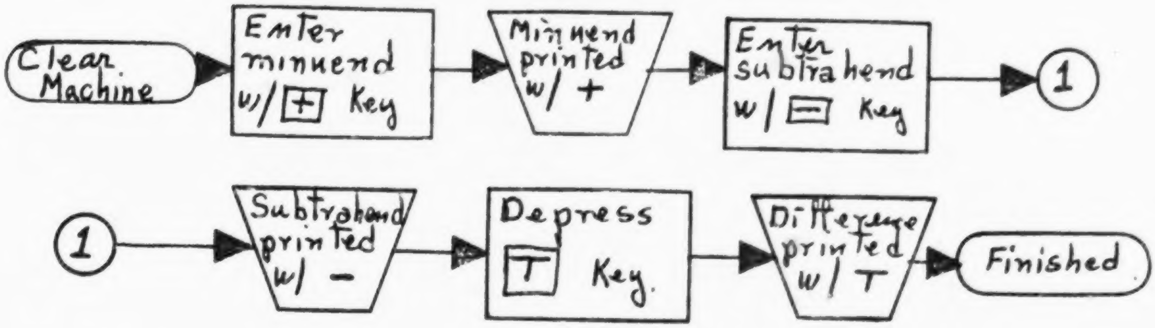
b) Punch 5 and then the Subtraction Key.

c) Punch $\boxed{T}$ The answer is 2.

T
7 +
5 -
2 T

Notice that the larger number is always put in first.

FLOWCHART FOR SUBTRACTION OF WHOLE NUMBERS


Clear Machine
Enter minuend w/ + Key
Minuend printed w/ +
Enter subtrahend w/ − Key
1
1
Subtrahend printed w/ −
Depress T Key
Difference printed w/ T
Finished

1-9 EXERCISES: Find the difference between the following numbers. Copy your answers from your tape to this page.

1.	2.	3.	4.	5.
8	28	45	66	88
5	10	15	23	27

6.	7.	8.	9.	10.
93	103	118	250	632
62	39	79	107	387

11.	12.
6000	2500
979	836

13. 408 - 196 = _____ Answer

14. 803 - 372 = _____ Answer

15. 2073 - 907 = _____ Answer

16. 60300 - 9830 = _____ Answer

Add the following numbers. Put answers on this page.

17.	18.	19.	20.
302	4000	21	34100
97	6002	1073	980
194	304	9	60000
30	5000	400	5000
400	7985	42	400
55	3142	7480	20
		212	8

21. 8000 + 60942 + 302 + 400 + 10 + 90 + 400 = ________

22. 100000 + 10000 + 1000 + 100 + 10 + 1 = __________

23. 3000000 + 300000 + 30000 + 3000 + 300 + 30 + 3 = ____________

24. 11 + 22 + 33 + 44 + 55 + 66 + 77 + 88 + 99 = ________

25. 200 + 20 + 400 + 40 + 600 + 60 + 800 + 80 = __________

26. 999,999,999,999 + 9 = __________________________

1-10 Reversing the Order of Subtracting Numbers

There is only one way to subtract numbers correctly on the machine at this time.

You must always enter the larger number first, and the smaller number second.

Example 1: Subtract, 405 - 227.

Correct Solution:	405 +	The larger number first.
	227 -	The smaller number second.
	178 T	Correct answer

This is the correct way to subtract.

Example 2: Subtract, 405 - 227.

Incorrect Solution:	227 +	Smaller number
	405 -	Larger number
	178 c T	Incorrect answer

NOTE: This is the wrong way to subtract. If you do the problem this way, your teacher will count it wrong.

Later in the course you will find out what the answer 178 c T really means.

1-11 Cancelling A Wrong Entry

Suppose you were adding some numbers and you found that you had printed one number wrong. Instead of doing the addition all over again, you can cancel out your mistake by subtraction.

Example 1: Add 1 + 2 + 3 + 4 + 5 + 6 + 7.

This is the way the problem should have been done:	But this is what you did:
1 + 2 + 3 + 4 + 5 + 6 + 7 + 28 T	1 + 2 + 3 + 4 + 5 + 6 + 8 + The 8 is wrong.

You have made a mistake by adding 8 instead of 7. Cancel out your mistake by <u>subtracting</u> 8. Now you can add in 7 and get the correct answer.

Here is how your tape would look:

```
  1 +
  2 +
  3 +
  4 +
  5 +
  6 +
  8 +}  {Your mistake is cancelled out.  Adding 8 and
  8 -}  {then subtracting 8 gives zero.
  7 + <-- Here you have printed the right number.
 28 T
```

1-11 EXERCISES

Practice with these. Write your answers on this page.

1. 3
6
2
5
7
9 – 8

The circled number 9 is wrong. It should have been 8.

Subtract 9.

Then add in 8 and find the total.

2.	3.	4.	5.
2	9	12	207
7	6	17	394
9	5	21	278
3	3	38	329
5	2	19	472 – 473
7 – 4	5 – 6	29 – 21	304

6.	7.	8.
200	14070	324000
309	7800	87000
473	15000	900000
589 – 598	60000 – 6000	31000
601	7920	7000 – 70000
723	13000	149000

9. 347 + 209 + 80 + 200 + 406 + 77 = ______
405

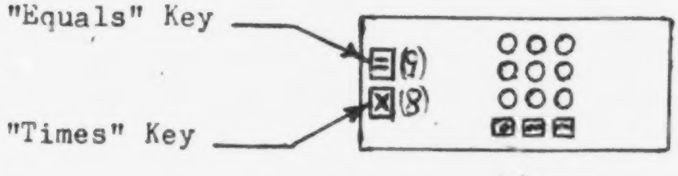
10. 3042 + 2977 + 3143 + 5132 + 6073 = ______
5123

11. 40300 + 50000 + 162000 + 73000 + 90000 = ______
16200

12. 34780 + 29070 + 34200 + 31400 + 67800 = ______
68700

1-12 Multiplication of Whole Numbers

This is a picture of the keys that you will use to multiply numbers.



MULTIPLICATION

is performed by entering the multiplier on the keyboard and depressing the Multiplier Key (8). The multiplicand is entered next and the Blue Equals Key (9) depressed. The product is automatically printed.

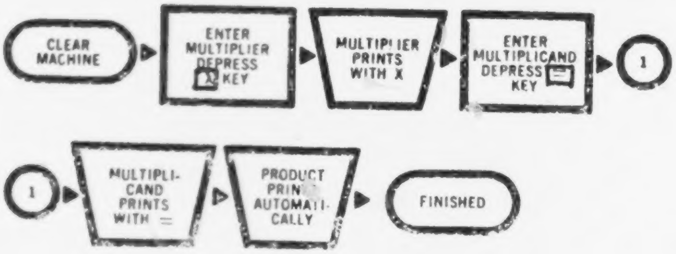
Example: 23 x 789 = 18147

Step 1 Enter 23 on keyboard, depress x key.

Step 2 Enter 789 on keyboard, depress = key. Product, 18147, is automatically printed.

Note: In general, to achieve maximum speed of operation, the number having the fewest digits should be entered as the multiplier when possible.

FLOWCHART FOR MULTIPLICATION OF WHOLE NUMBERS


CLEAR MACHINE
ENTER MULTIPLIER DEPRESS KEY
MULTIPLIER PRINTS WITH X
ENTER MULTIPLICAND DEPRESS KEY
1
1
MULTIPLICAND PRINTS WITH =
PRODUCT PRINTS AUTOMATICALLY
FINISHED

IMPORTANT: Do not use this key, ÷, when multiplying numbers. This is a "Division Equals" Key and can only be used for division.

1-12 EXERCISES: Multiply the following numbers. Put your answers in the workbook.

1. 8 x 2 = ____
2. 3 x 8 = ____
*3. 5 x 8 = ____
*4. 8 x 5 = ____
5. 6 x 9 = ____
6. 8 x 8 = ____
7. 12 x 4 = ____
8. 3 x 15 = ____
9. 8 x 10 = ____
10. 9 x 25 = ____
11. 32 x 8 = ____
12. 47 x 7 = ____
*13. 21 x 16 = ________
*14. 16 x 21 = ________
15. 37 x 43 = ________
16. 82 x 90 = ________
17. 70 x 80 = ________
18. 100 x 100 = ________

(What do you notice about the examples with a star?)

19. 63 x 403 = ________

20. 209 x 98 = ________

21. 337 x 78 = ________

22. 47 x 100 = ________

*23. 39 x 203 = ________

*24. 203 x 39 = ________

25. 347 x 890 = ________

26. 804 x 1000 = ________

27. 1000 x 307 = ________

28. 8430 x 4242 = ________

29. 19876 x 6789 = ________

30. 17200 x 4070 = ________

31. 40,000,000 x 30,000 = ________________

Count the number of digits in your answer. There should be 13 digits.

32. 400,000,000 x 30,000 = 12,000,000,000,000

When you punch the $\boxed{\times}$ key for this example, the key will just stay down. The machine can <u>not</u> print the answer because the answer has <u>more than 13 digits</u> in it.

This machine can only print answers that have 13 digits or less.

1-12 REVIEW EXERCISES: Perform the indicated operations. Put answers on this page.

1. 3043 - 897 = ______

2. 6034 + 297 = ______

3. 874 x 32 = ______

4. 37600 - 980 = ______

5. 3952 +8370 = ______

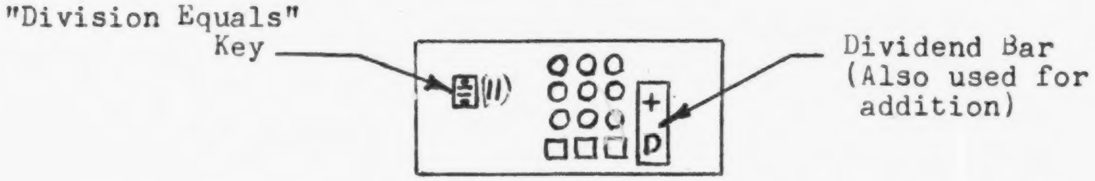
6.
```
 8403
  201
 7000
  895
   98
 1023
  947
______
```

7.
```
 8435
- 273
```

8.
```
 2078
 x349
______
```

1-13 Division of Whole Numbers

This is a picture of the keys used for division.



DIVISION

is performed by entering the dividend with the Addition Key (marked with a D to identify its role of dividend entry) then entering the divisor and depressing the Division Key (11). The quotient and remainder, if any, will automatically print in that order.

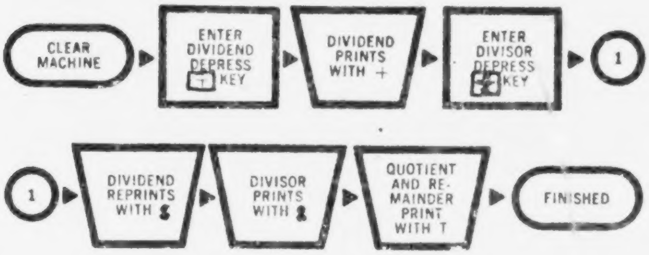
Example 1 145 ÷ 12 = 12 and 1 remainder

Step 1 Enter dividend, 145, depress Add Key.

Step 2 Enter divisor, 12, depress Division Key. Quotient, 12, is automatically printed followed by remainder 1.

Note: The quotient is **always** automatically entered into the memory.

FLOWCHART FOR DIVISION OF WHOLE NUMBERS


CLEAR MACHINE
ENTER DIVIDEND DEPRESS T KEY
DIVIDEND PRINTS WITH +
ENTER DIVISOR DEPRESS ÷ KEY
1
1
DIVIDEND REPRINTS WITH :
DIVISOR PRINTS WITH :
QUOTIENT AND RE-MAINDER PRINT WITH T
FINISHED

Example 2: Divide 12 by 3.

a) Press 12 and then the D Key.

b) Press 3 and then the $\boxed{\div}$ key.

Your tape should look like this:

```
12 +
12 :
 3 :
 4 T
   T
```

When 12 is divided by 3, the answer is 4. Is there any remainder? Let us see how the machine shows us this.

Example 3: What is 36 divided by 9?

Solution: Enter into the machine 36 $\boxed{D}$ 9 $\boxed{\div}$

Your work is printed like this ⟶

```
36 +
36 :
 9 :
 4 T
   T
```

Since there are exactly 4 nines in 36, there is <u>no remainder</u>. The machine shows that there is no remainder by not printing a number to the left of the last T on the tape. It does <u>not</u> print 0 T.

<u>NOTE</u>: In every division problem, your tape will show <u>two T's</u> on the tape.

a) The first T shows the whole number part of the answer.

b) The last T shows the remainder, if any.

Example 4: What is 120 ÷ 10?

Other ways to state the same problem are:

a) Divide 120 by 10.

b) What is 120 divided by 10?

Solution: Enter into the machine 120 $\boxed{D}$ 10 $\boxed{\div}$

The answer is, 12T
T ← No Remainder

Example 5: Find the quotient of $23\overline{)1288.}$

Do you remember: $\begin{array}{r} \text{Quotient} \\ \text{Divisor}\overline{)\text{Dividend}} \end{array}$

Fill in the blanks:

a) 1288 is the ________.

b) 23 is the ________.

c) We are finding the answer, or ________.

Solution:

a) Enter the Dividend first, 1288, and then punch D.

b) Enter the Divisor second, 23, and then punch $\boxed{\div}$

The Quotient (the answer) is 56 T
T No Remainder

Think: $\begin{array}{r} 56 \text{ R } 0 \\ 23\overline{)1288} \end{array}$

Example 6: How many 10's are there in 2500?

Solution: The Dividend is 2500.

The Divisor is 10.

a) Enter the Dividend first, 2500, and then punch D.

b) Enter the Divisor second, 10, and then punch $\boxed{\div}$

The Quotient is 250 T What is the Remainder?
T

While the machine is dividing, do you notice that the Column Indicator shows when the division is all done?

1-13 EXERCISES: Find the Quotients and Remainders for these division problems. Put answers on this page.

1. Divide 16 by 4. __ R __
2. " 32 by 16. __ R __
3. " 50 by 10. __ R __
4. " 84 by 4. __ R __
5. " 66 by 66. __ R __

6. What is 64 divided by 16. __ R __
7. " " 45 divided by 3. __ R __
8. " " 96 divided by 16. __ R __
9. " " 75 divided by 75. __ R __
10. " " 98 divided by 2. __ R __

11. What is 144 ÷ 9? __ R __
12. " " 162 ÷ 18? __ R __
13. " " 175 ÷ 25? __ R __
14. " " 360 ÷ 8? __ R __
15. " " 270 ÷ 45? __ R __

16. $45\overline{)1035}$ R

17. $20\overline{)720}$ R

18. $39\overline{)1872}$ R

19. $98\overline{)7644}$ R

20. How many 10's are there in 320. ___ R __
21. " " 100's are there in 3,400. ___ R __
22. " " 890's are there in 78,320. ___ R __

23. How many 21's are there in 9,366. ____R __

24. " " 1000's are there in 624,000. ____R __

25. " " 100's are there in 9,800,000. _____R __

26. What is 4466 divided by 77. ___ R __

27. What is 367,836 ÷ 604. ____R __

28. How many 40's are there in 26320. ____R __

29. Divide 320,000 by 64. __________R __

30. $303\overline{)138{,}168}$ R

31. $9\overline{)999{,}999{,}999{,}999}$ R

1-14 REVIEW EXERCISES

A Addition

1.	2.	3.	4.	5.
34	62	40	444	606
8	10	50	44	60
21	7	60	4	6
9	5	70	44	60
37	20	80	444	606

6. 50 + 109 + 232 + 75 + 9 + 60 + 3 + 500 = _____

7. 3,472 + 8,004 + 90,000 + 63,002 + 40,777 = __________

8. 32 + 437 + 5,389 + 60,732 + 598,400 = __________

9. 985,000 + 80,000 + 7,000 + 107,000 = __________

B Subtraction

10.	11.	12.	13.	14.
302	115	490	600	3210
97	86	108	152	1230

15. 852 - 625 =

16. 1008 - 29 =

17. Subtract 9022 from 9422 =
18. " 12145 from 12209 =
19. " 30725 from 31000 =
20. " 6980 from 10200 =
21. " 76000 from 100000 =
22. " 46125 from 98213 =

C Multiplication

23. 47 x23
24. 52 x30
25. 107 x37
26. 198 x45

27. 2007 x 43
28. 5030 x 57
29. 4150 x 69
30. 5032 x 48

31. 312 x482
32. 415 x275
33. 814 x259
34. 602 x907

35. 37900 x 42 = ________
36. 50300 x 28 = ________
37. 92200 x 152 = ________
38. 107350 x 780 = ________
39. 23 x 100 = ________
40. 6070 x 1000 = ________
41. 31400 x 10 = ________
42. 362 x 1000= ________
43. 100 x 462 = ________
44. 10 x 5030 = ________
45. 1000 x 9430 = ________
46. 100 x 20070 = ________

D Division

47. $8\,\overline{)4840}$
48. $5\,\overline{)30060}$
49. $12\,\overline{)540}$
50. $23\,\overline{)139242}$
51. $68\,\overline{)666400}$
52. $112\,\overline{)50400}$
53. $18\,\overline{)1170}$
54. $175\,\overline{)1,400,000}$
55. $126\,\overline{)7,308,000}$

56. Divide 448 by 8. __________ R ___

57. Divide 156 by 13. __________ R ___

58. Divide 45,900 by 102. __________ R ___

59. Divide 3420 by 9. __________ R ___

60. Divide 3600 by 24. __________ R ___

61. Divide 109,200 by 104. __________ R ___

62. 756 ÷ 756 = __________ R ___

63. 80732 ÷ 80732 = __________ R ___

64. 903150 ÷ 45 = __________ R ___

65. 164160 ÷ 360 = __________ R ___

66. 288,000,000 ÷ 32 = __________ R ___

67. 984,000,000 ÷ 12 = __________ R ___

68. How many tens are there in 10700. __________ R ___

69. How many hundreds are there in 19200. __________ R ___

70. How many thousands are there in 90000. __________ R ___

71. How many 100's are there in 102000. __________ R ___

72. How many 100's are there in 8,400,000. __________ R ___

73. How many thousands are there in 12,345,000. __________ R ___

74. How many hundreds are there in 834,200. __________ R ___

75. How many tens are there in 900030. __________ R ___

Answer to problem in Introduction to the Student

```
   3456789  Beans in one jar
     x 789  Jars
  31111101
 27654312
24197523
2727406521
```

76. (Optional) Find the missing numbers in each of the following.

$$8 = 3\overset{8}{\overline{)24}} = 3\overset{+\ 1}{\overline{)21+\_\_}} = 3\overset{+\ +}{\overline{)3+9+\_\_}}$$

$$10 = 4\overset{10}{\overline{)\_\_\_}} = 4\overset{+}{\overline{)20+\_\_}} = 4\overset{-\ 2}{\overline{)48-\_\_}}$$

$$13 = 5\overset{13}{\overline{)\_\_\_}} = 5\overset{10\ +}{\overline{)\_\_\_+\_\_\_}} = 5\overset{5+\ \ +5\ -}{\overline{)\_\_+25+\_\_-\_\_}}$$

$$6 = 4\overset{7+3\ -}{\overline{)\_\_+\_\_-\_\_}} = 4\overset{-\ 5-}{\overline{)44-\_\_-\_\_}} = 4\overset{-7\ +\ \ -6}{\overline{)\_\_-\_\_+40-\_\_}}$$

$$25 = \_\_ \times 5 = \_\_ \div 4 = \_\_ + 7 = 62 - \_\_$$

$$31 = \_\_ \times 6 + 1 = 17 + 77 - \_\_ = 39 \div \_\_ + 18$$

$$15 = 11\overset{+}{\overline{)\_\_+110}} = 12\overset{+}{\overline{)\_\_+108}} = 13\overset{+}{\overline{)130+\_\_}}$$

$$12 = 7\overset{+}{\overline{)\_\_+14}} = 8\overset{6\ +}{\overline{)\_\_+\_\_}} = 9\overset{-}{\overline{)180-\_\_}}$$

$$\_\_ = 2 \times 10 + \_\_ = 5\overline{)150} = \_\_ * 5 + 0$$

Chapter II

DECIMALS

CHAPTER II
Decimals

2-1 Addition of Decimals

To add decimals on the calculating machine, we must keep the decimal points in the same column.

Example: 43.60
216.93
102.16

Add these numbers on the machine and copy your answer from the tape into your workbook under the example. Place the decimal point in the same column in your answer as you have in the numbers being added. Your answer should be 362.69.

4 3.6 0
2 1 6.9 3
1 0 2 1 6
3 6 2.6 9

2-1 EXERCISES: Add these problems. Place the decimal point in the correct position in each number on the tape, so that you can read your answer in dollars and cents. Then copy the answer for each problem in your workbook.

1.	2.	3.	4.	5.
$7.35	$5.85	$18.61	$15.03	$ 6.14
1.82	.72	1.89	22.88	3.25
3.06	2.47	26.23	30.21	41.30
				.43

6.	7.	8.	9.	10.
$ 3.09	$ 505.07	$ 340.00	$ .58	$48.55
23.45	61.60	450.00	7.93	9.10
46.18	89.00	700.00	40.51	.73
30.23	901.40	501.20	4.89	8.62
	469.28	2770.43	6.37	11.59
			11.10	68.43

2-2 Adding Zeros To Numbers To Keep Decimal Points In Line

When you add $21.60, $1, $52.50 and $3 you need to fill the spaces for cents with zeros to <u>keep</u> <u>decimal</u> <u>points</u> <u>under</u> <u>each</u> <u>other</u> and <u>keep</u> <u>columns</u> <u>straight</u>.

Example: $21.60
1.<u>00</u>
52.50
<u>3.00</u>
$78.10 Check this answer on your machine.

```
2160 +
 100 +
5250 +
 300 +
7810 T
```

2-2 EXERCISES: In the following problems copy the numbers in columns in the space provided. Be careful to copy decimal points under each other; then add with pencil to find the answers.

1. 32.6 + 7.14 + 0.8 + 14
2. 43.6 + 413.83 + 102.16
3. 61.4 + 3.25 + 41.3 + .692
4. 55.1 + 46.3 + 53.91 + 16
5. 2.3 + 3.14 + 45.18 + 4.05 + 4 + 23.125
6. 8.13 + 4.25 + 5.625 + 3 + 1.2 + 78.94

1. 2. 3. 4. 5. 6.

Now add each of the above problems on the machine and check your answers. Remember to fill the spaces with zeros, so that the decimal points will be in a straight line. Place the decimals correctly on the tape.

2-3 Horizontal Addition of Decimals

First find the number in the problem that has the greatest number of digits after the decimal point. Then add zeros to the other numbers so that each number in the problem has the same number of digits after the decimal point to keep the decimal points in a straight line. Your machine will print zeros following another digit, but you cannot enter a zero on the machine before another digit.

Find the answers to the following problems by putting the numbers directly into the machine.

Example: Add, 8.13 + 4.25 + 5.625 + 3. + .01

The number 5.625 has three digits after the decimal point. Therefore, you must place 8.130, 4.250, 5.625, 3.000 and .010 in the machine to get the correct answer 21.015.

```
 8130  +
 4250  +
 5625  +
 3000  +
   10  +
21015  T
```

ADD: Show all decimal points on the tape; copy answers on this sheet.

1. .6 + .02 + .849 + 1.3 = ______
2. 2.7 + .48 + 2 + 19.05 = ______
3. 9 + .5 + .0041 + 6.4 = ______
4. 7.8 + 7.08 + .078 + .78 = ______
5. 15.472 + .003 + 3.6518 + 20.92 = ________
6. 10 + .98 + 2.75 + 6.49 + 4 + 5.6265 = ________
7. .83 + 7 + 4.45 + .049 + 26.10 + 1.5 = ______
8. .06 + 1.2 + 46 + 3.825 + .075 + 125 = ______
9. .83 + .375 + 13 + 3.9 + 5.928 + 1 = ________
10. 1.4 + 26 + .39 + 5.928 + .051 + 7 = ________
11. 3.3 + .07 + 6 + 2.63 + .174 + 12.25 = ______

12. 15.6 + .19 + 4.75 + .836 + 200 + 6.9 = ______

13. $5 + $12.49 + $8.03 + $72 + $43.43 + $21.12 = ______

14. $9.07 + $10 + $34.72 + $7.91 + $18.05 + $19.98 = ______

2-4 Subtraction of Decimals

Remember that we must keep decimal points in the same column when we subtract decimals.

Example:	$98.35	Place 9835 in the machine and press the add key.
	-16.69	Place 1669 in the machine and press the red subtraction key. Then press the total key to find the answer.

You will need to fill spaces with zeros to keep decimal points in line when you subtract as you did in addition.

2-4 EXERCISES: Subtract; show all decimal points on your tape. Copy answers here.

1. 2.8 -1.2	2. .63 -.08	3. 7.9 -0.82	4. 47 - 2.64
5. $10 - 1.98	6. .043 -.036	7. .5 -.268	8. 4.006 -.075

Copy the following problems in the space provided below, so that the decimal points will be under each other. Use pencil to find the answers. Then check the problems on the machine. Place the decimal point correctly in each number on the tape. Then copy the answers in the workbook.

9. 32.97 - 1.82 = ____
10. 375.2 - 18.7 = ____
11. 76.75 - 8.07 = ____
12. .582 - .096 = ____
13. .913 - .244 = ____
14. 1.456 - .792 = ____

15. 42.005 - 13.996 = ______

16. 237.17 - 49.98 = ______

17. 406.003 - 27.625 = ______

18. 509.002 - 209.013 = ______

19. 236.4 - 187.9 = ______

20. 542 - 4.987 = ______

2-5 Multiplication of Decimals

When we multiply two decimals, we add the number of digits after the decimal point in the two factors; then we point off that number of decimal places in the product counting from right to left.

Example:		
21.3 (one place) x 19 (No places) 1917 213 404.7 (one place)	5.13 (two places) x4.2 (one place) 1026 2052 21.546 (three places)	2.153 (three places) x4.06 (two places) 12918 86120 8.74118 (five places)

2-5A EXERCISES: Place the decimal point correctly in the answer to each of the following multiplication examples.

1. 4.27 x 32 13664	2. 45.987 x .427 19636449	3. 7384 x 8.48 6261632	4. 7656 x .38 290928
5. .777 x 3.29 255633	6. 4.71 x 62.7 295317	7. 42.18 x .543 2290374	8. 87.5 x .345 301875
9. 9.41 x .044 41404	10. .5923 x .231 1368213	11. 11.9 x .824 98056	12. 7.9 x 8.3 6557
13. .0091 x .678 61698	14. 93.76 x .423 3966048	15. .0902 x 3.005 2710510	16. .0054 x0.0035 1890

2-58 EXERCISES: Find the products using the machine. Place the decimal properly in each number on the tape. Then transfer the answer for each problem to your workbook.

1. 2.1 x 9
2. .21 x 9
3. .21 x 90
4. 2100 x .9
5. 2.1 x.09
6. 5.09 x1.6
7. 50.9 x.16
8. 50.9 x 16
9. 5090 x1.6
10. .509 x.016
11. .073 x 4.61
12. 4.75 x 6.89
13. 4.006 x 3.1
14. 2.125 x .45
15. 16.18 x 4.9

2-6 Locating Decimal Point Directly On Tape

You can locate the decimal point in your product directly on the tape in your machine. For example to multiply 156.75 by 13.976, enter 15675 into the machine and press the times key; then enter 13967 and press the equals key. Place the decimal in each number on the tape. With your pencil start from the decimal point in 13.967 (the second factor) and draw a vertical line down to the product. Then move to the left two places in the product, the number of decimal places in the first factor 156.75; the answer is 2189.32725.

```
        1 5 6 7 5 x <
        1 3 9 6 7  =
2 1 8 9 3 2 7 2 5  T

                   T

        1 5 6.7 5 x <
        1 3.9 6 7  =
2 1 8 9.3 2 7 2 5  T
```

2-6 EXERCISES: Multiply the following decimals. Locate the decimal point in the product by using the pencil line on the tape.

1. 75 x 56.17 = ____
2. 24 x 3168 = ____
3. 4.80 x 760 = ____
4. 32 x 3.1416 = ____
5. .87 x 5.93 = ____
6. .4567 x 4191 = ______
7. 1.06 x 12.52 = ______
8. 1.425 x .375 = ______
9. .064 x 28.2 = ______
10. 36.6 x .009 = ______

11. .26 x .368 = ______
12. .625 x 32.49 = ______
13. .034 x 70.84 = ______
14. 1.39 x 7.9582 = ______
15. .268 x .924 = ______
16. 1.125 x 85.26 = ______
17. .375 x 453.40 = ______
18. 6.25 x 3.1416 = ______
19. .0025 x .7854 = ______
20. .015 x 8.504 = ______

2-7 Multiplication By 10, 100, or 1000

When you multiply by 10, 100, or 1000, you do not need to use the machine. Just move the decimal point as many places to the right as there are zeros in the multiplier.

Example: 10 x 28 = 280. 100 x 28 = 2800. 1000 x 28 = 28000

2-7 Exercises:

	NUMBER	X 10	X 100	X 1000
1.	12.50	______	______	______
2.	1.75	______	______	______
3.	17.5	______	______	______
4.	3.84	______	______	______
5.	2068	______	______	______
6.	.14	______	______	______

7.	.025	______	______	______
8.	4.01	______	______	______
9.	10.52	______	______	______
10.	6.375	______	______	______

2-8 Multiplication By .1, .01, .001

When you multiply by .1, .01, or .001 move the decimal point as many places to the left as there are decimal places in the multiplier.

Example; .1 x 69 = 6.9   .01 x 69 = .69   .001 x 69 = .069

2-8 EXERCISES:

	NUMBER	x .1	x .01	x .001
1.	6.3	______	______	______
2.	12.7	______	______	______
3.	.325	______	______	______
4.	42.61	______	______	______
5.	500.5	______	______	______
6.	8592.4	______	______	______
7.	285.06	______	______	______
8.	.465	______	______	______
9.	0.035	______	______	______
10.	4.925	______	______	______
11.	.0345	______	______	______
12.	0.9806	______	______	______
13.	348.003	______	______	______
14.	49.98	______	______	______

2-9 Division

Many division problems have decimals. Even though you may be dividing whole numbers, your answer may contain a decimal. A whole number really has a decimal point at the end of the number. Usually, however, we do not write it. In division, you must place this decimal point at the end of the number that is the dividend.

To place the decimal point in the proper place in the answer, follow this procedure: Be sure the divisor is a whole number. If necessary, move the decimal point in the divisor as far to the right as possible. Then move the decimal point in the dividend the same number of places to the right, filling in zeros if needed. Now place the decimal point in the answer directly above the decimal point in the dividend.

Example 1: $2\,\overline{)4.8}$ $\quad 2\,\overline{)4\overset{\bullet}{.}8}$

Example 2: $2.3\,\overline{)4.6}$ $\quad 2\cancel{.}\underset{\frown}{3}.\,\overline{)4\cancel{.}\underset{\frown}{6}\overset{\bullet}{.}}$

Example 3: $.23\,\overline{)4.657}$ $\quad \cancel{.}\underset{\frown}{23}.\,\overline{)4\cancel{.}\underset{\frown}{65}\overset{\bullet}{.}7}$

Example 4: $7.586\,\overline{)987.4}$ $\quad 7\cancel{.}\underset{\frown}{586}.\,\overline{)987\cancel{.}\underset{\frown}{400}\overset{\bullet}{.}}$

(Note the need for additional zeros in the dividend.)

2-9 EXERCISES: Place the decimal point in the proper place in each of the following quotients.

1. $3\,\overset{231}{\overline{)6.93}}$ 2. $.3\,\overset{231}{\overline{)6.93}}$ 3. $.03\,\overset{2\ 31}{\overline{)6.93}}$ 4. $3\,\overset{23\ 1}{\overline{)69.3}}$

5. $3\,\overset{231}{\overline{).693}}$ 6. $.3\,\overset{23\ 1}{\overline{)69.3}}$ 7. $.3\,\overset{231}{\overline{)693}}$ 8. $.03\,\overset{231}{\overline{)693}}$

9. $3.003\overset{231}{\overline{)693693}}$ 10. $30.03\overset{2\ 31}{\overline{)6.93693}}$ 11. $.3003\overset{23\ 1}{\overline{)69.3693}}$

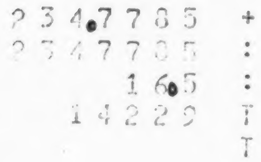
12. $3.003\overset{231}{\overline{)6936.93}}$ 13. $7\overset{1428\ldots}{\overline{)1}}$ 14. $.7\overset{1428\ldots}{\overline{)1}}$

2-10 Location of Decimal Point Directly on the Tape

The method of Section 2-9 may also be used to place the decimal point in the quotient when you use the machine to divide. Example: $16.5\overline{)234.7785}$

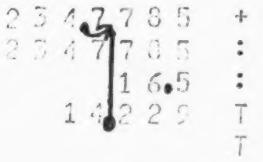
In doing this problem by hand, you would place the decimal point in the answer in this way: $16\overset{\curvearrowright}{.}5\overline{)234\overset{\curvearrowright}{.}\overset{\bullet}{7}785}$

To do this problem on the machine, you enter the dividend 2347785 with the "D" key. Then enter the divisor 165 and press the division equals key. This is the way your tape will appear with the decimal points written in.



```
234.7785 +
2347785  :
    16.5 :
   14229 T
         T
```

To locate decimal points on your tape, do the following: Count the number of decimal places in the divisor. Then, on your tape, start from the decimal point in the dividend and move the same number of places to the right. Now draw a vertical line down to the answer. (The number printed in front of the first T, remember, is the quotient.) Place the decimal point between 4 and 2 in our example so that it reads 14.229.



```
234.7785 +
2347785  :
    16.5 :
   14.229 T
          T
```

2-10a EXERCISES: Divide each of the following using only the numbers given. (Use the machine.) Correctly locate the decimal for each answer on your tape. Drop any remainders.

1. $2.3\overline{)12.11}$ 2. $1.9\overline{)90.92}$ 3. $6.2\overline{)83.74}$ 4. $19.6\overline{)101.92}$

5. $25.4\overline{)82.25}$ 6. $26\overline{)91.44}$ 7. $75\overline{)315.75}$ 8. $24\overline{)11.688}$

9. $3.2\overline{)21.312}$ 10. $7.1\overline{)14.981}$ 11. $8.8\overline{)325.692}$ 12. $5.1\overline{)46.926}$

13. $7.54\overline{)9.024}$ 14. $.83\overline{)4.316}$ 15. $7.58\overline{)20.466}$ 16. $2.43\overline{)30.132}$

2-11 Division Problems Requiring Insertion of Zeros

In order to get an answer to the desired number of decimal places, it is sometimes necessary to put in additional zeros in the dividend. After locating the decimal point in the quotient, you can determine how many zeros to put in the dividend to get the required number of decimal places in the answer. (If you are not sure of how many zeros to use, it is better to use too **many** rather than not enough.)

Example 1: $8\overline{)13}$ $\begin{array}{r} 1.625 \\ 8\overline{)13.000} \end{array}$ To get an answer with 3 decimal places, 3 zeros were punched as part of the dividend.

Example 2: $5\overline{)2}$ $\begin{array}{r} .4 \\ 5\overline{)2.0} \end{array}$

Example 3: $2.1\overline{)4}$ $\begin{array}{r} 1.9 \\ 2.1\overline{)4.00} \end{array}$

Note: To get an answer with one decimal place, two extra zeros were punched. If three decimal places were desired, four extra zeros would need to be punched in the dividend.

2-11A EXERCISES: Use the machine to do the following problems. Give all answers to two decimal places.

1. $8\overline{)5}$ 2. $8\overline{)7}$ 3. $8\overline{)9}$ 4. $8\overline{)11}$

5. $4\overline{)3}$ 6. $4\overline{)17}$ 7. $5\overline{)13}$ 8. $5\overline{)62}$

9. $10\overline{)62}$ 10. $12\overline{)390}$ 11. $16\overline{)6}$ 12. $35\overline{)28}$

13. $.12\overline{)521.56}$ 14. $.39\overline{)265.2}$ 15. $.79\overline{)4.661}$ 16. $.96\overline{)8.8}$

17. $.56\overline{)2.4472}$ 18. $1.44\overline{)135.072}$ 19. $4.125\overline{).94875}$

20. $.079\overline{)298}$ 21. $.048\overline{)18.217}$ 22. $.868\overline{)365.9}$

2-11B EXERCISES: Use the machine to do the following. Give all answers with three decimal places.

1. $1.05\overline{)73.5}$ 2. $.96\overline{)38.4}$ 3. $1.25\overline{)537.5}$ 4. $.1667\overline{)40.02}$

5. $4.125\overline{)9487.5}$ 6. $.382\overline{)893.88}$ 7. $.92\overline{)251.12}$ 8. $1.375\overline{)132}$

9. $.04\overline{)122.8}$ 10. $.625\overline{)15}$ 11. $.39\overline{)265.2}$ 12. $1.47\overline{)3719.1}$

13. $16\overline{)3}$ 14. $16\overline{)11}$ 15. $16\overline{)25}$ 16. $32\overline{)42}$

17. $48\overline{)51}$ 18. $64\overline{)204}$ 19. $96\overline{)222}$ 20. $128\overline{)72}$

2-12 Division of Decimal by a Whole Number--Placing Zero After Decimal Point Before Non-Zero Digits

Sometimes it is necessary to place a zero after the decimal point in the answer before writing the other digits. For example, $\overset{.041}{6\overline{).246}}$ This zero, which is needed before the other digits in your answer, does not appear on the tape. You will need to set up your problem on your paper and locate the decimal point. Then you can decide where to place the first digit with value and fill spaces with zeros between the decimal point and the first number shown on the tape. To divide $\overset{.015}{31\overline{).465}}$ place the decimal point in the quotient above the decimal point in the dividend. Since 31 does not go into 4, you place a zero above the 4 in your answer after the decimal point: 31 goes into 46 one time, so you place a one above the 6 as the first number with value, then complete the division.

2-12 EXERCISES: Use the machine to find these quotients. Be sure to show the decimal point in the answer along with any zeros needed between the decimal point and the first digit of the answer.

1. $17\overline{)1.241}$
2. $97\overline{)5.432}$
3. $56\overline{).896}$
4. $24\overline{)1.92}$
5. $734\overline{)22.02}$
6. $546\overline{)32.76}$
7. $314\overline{)19.782}$
8. $243\overline{)3.0132}$
9. $823\overline{)6.584}$
10. $815\overline{)1.5485}$
11. $709\overline{)4.10511}$
12. $72\overline{)4.680}$

2-13 Rounding Off Numbers

You have been finding your quotients in division to two decimal places or three decimal places. Sometimes you are asked to find an answer to the nearest hundredth or nearest tenth, or nearest whole number.

To find an answer to hundredths, you must find your answer to three decimal places, then round off to two places.

To find your answer to the nearest tenth, you need to find your answer to two decimal places, then round off to one place. Remember that if the last figure to be dropped is 0, 1, 2, 3, or 4, you leave the preceding number as it is. If the last figure to be dropped is 5, 6, 7, 8, or 9, then make the preceding figure one greater than it is.

To round off the number 785.625

to the nearest hundredth is 785.63

to the nearest tenth is 785.6

to the nearest whole number is 786

2-13 EXERCISES

	NUMBER	NEAREST HUNDREDTH	NEAREST TENTH	NEAREST WHOLE NUMBER
1.	376.3829			
2.	15.328			
3.	24.1358			
4.	6.753			
5.	0.217			
6.	6.4571			
7.	7.0709			
8.	2.9037			
9.	0.599			
10.	51.6617			

2-14 Rounding Off Quotients by Use of the Remainder

You may recall that in division which does not come out exactly, the quotient may be written with the remainder expressed as a fraction. For example:

```
    1
6 ) 10
    6
    4
```

(Note that the remainder over the divisor becomes a fractional part of the quotient.)

Thus, we may round off a quotient by comparing the remainder to the divisor. If the remainder is half or more than half of the divisor, round upward. If the remainder is less than half of the divisor, leave the quotient and drop the remainder.

Example 1:

```
   3
2 ) 7
    6
    1
```

Rounded off to the nearest whole number, the answer is 4 because 1 is half of the divisor 2.

Done on the machine, your tape would look like this:

```
7  ÷
7  :
2  :
3  T
1  T
```

Answer: 4

Example 2:

```
     9 7
3 ) 29.3
    27
     2 3
     2 1
       2
```

To the nearest tenth, this answer is 9.8 because 2 is more than half of 3.

The tape for this problem would look like this:

```
2 9.3  +
2 9|3  :
    3  :
  9.7  T
    2  T
```

Answer: 9.8

Example 3:

```
     74.66
6 ) 448.00
    42
     28
     24
      4 0
      3 6
        40
        36
         4
```

To the nearest hundredth, the answer is 74.67.

The tape would look like this:

```
4 4 8.0 0  +
4 4 8|0 0  :
        6  :
  7 4.6 6  T
        4  T
```

Answer: 74.67

41-a

2-14 EXERCISES: Find the following quotients to the nearest whole number.

1. 1.15)83.5 2. .98)38.6 3. 1.25)568.9 4. .1687)40.07

5. 4.352)9487.5 6. .382)983.99 7. .93)252.22 8. 1.354)232

9. .06)122.8 10. 625)15 11. .39)254.4 12. 1.47)3654.1

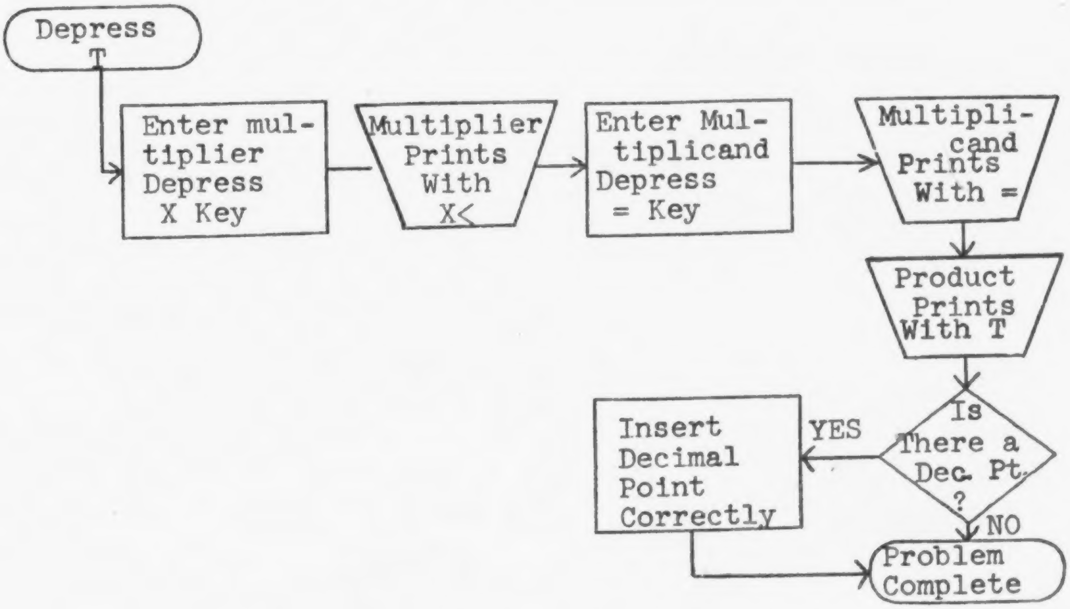
Find the following quotients to the nearest hundredth. Be sure to show the decimal point in the proper place.

13. .12)562.57 14. .38)265.2 15. .79)4661

16. .96)8.88 17. .56)24473 18. 1.44)135.007

19. 4.125).96875 20. .079)289 21. .048)18.227

OPTIONAL: Here is a flowchart for multiplying decimals.



Depress T
Enter multiplier Depress X Key
Multiplier Prints With X<
Enter Multiplicand Depress = Key
Multiplicand Prints With =
Product Prints With T
Is There a Dec. Pt. ?
YES
NO
Insert Decimal Point Correctly
Problem Complete

22. Make a flowchart for dividing with decimals.

2-15 Rounding off Quotients

EXERCISES: Find the following quotients. **Show all decimal points on your tape.**

Round off to the nearest hundredth:

1. 3.7654 ÷ 52 = ______
2. 12.45 ÷ 7 = ______
3. 45.368 ÷ 1.5 = ______
4. .96 ÷ 7.8 = ______
5. 3.784 ÷ 8.2 = ______
6. 25.1 ÷ 36 = ______
7. 8.154 ÷ 19 = ______
8. 11.669 ÷ 4.7 = ______
9. 8.0629 ÷ 50.7 = ______
10. 2.7125 ÷ 3.43 = ______

Round off to nearest tenth:

11. 9.945 ÷ 1.17 = ______
12. 173.52 ÷ 2.4 = ______
13. 65.178 ÷ 5.4 = ______
14. 53.935 ÷ 8.05 = ______
15. 36.84 ÷ 4.46 = ______
16. 65.751 ÷ 3.03 = ______
17. 45.2751 ÷ 5.07 = ______
18. 18.061 ÷ 2.5 = ______
19. 3409.44 ÷ 4.8 = ______
20. 181.69 ÷ 7.8 = ______

Round off to nearest whole number:

21. 32.4 ÷ 1.8 = ______
22. 27.95 ÷ .43 = ______
23. 48.024 ÷ .036 = ______
24. 83.89 ÷ 1.9 = ______
25. 45.961 ÷ 7.5 = ______
26. 19,887.012 ÷ 318.6 = ______
27. 401.6187 ÷ 1.47 = ______
28. 3.1416 ÷ .7854 = ______
29. 101.849 ÷ 2.35 = ______
30. 10.444 ÷ .28 = ______

2-16 Review

Add: Show decimal points on your tape.

1. 2.651 + 3.278 + 41.89 + 6.132 = ______
2. 39.25 + 4.391 + 27.6 + 5.945 = ______
3. 129.36 + 3.785 + 21.55 + 418.602 = ______
4. $123 + $1.23 + $12.30 + $1.23 = ______
5. .12 + $91 + $6 + $8.04 + $.50 = ______
6. 17.09 + 43.76 + 14.105 + 7.89 = ______
7. 2.3 + 3.14 + 45.165 + 4.05 + 4 + 23.15 = ______
8. 10 + .98 + 2.75 + 6.49 + 4 + 5.6265 = ______

Subtract: Show decimal points on tape.

1. 302.475 - 109.708 = ______
2. 8.4 - .25 = ______
3. $25 - $.47 = ______
4. $8.36 - $4 = ______
5. $45 - $2.75 = ______
6. $315,729.26 - $204,156.10 = ______
7. 500.72 - 209.5675 = ______
8. 7604.91 - 4058.497 = ______

Multiply: Show decimal points on tape. Round off answers to nearest hundredth.

1. 52 x 74.6 = ______
2. .306 x .481 = ______
3. 58.4 x .079 = ______
4. 49.6 x 9.5 = ______

44-a

5. 7.82 x .57 = ______

6. 7.48 x 80.6 = ______

7. 2.72 x .196 = ______

8. 78 x 3.6 = ______

9. .78 x 36 = ______

10. 9.28 x .075 = ______

Divide: Show decimal points on tape. Draw horizontal line to the right in the dividend, then the vertical line to locate the decimal point in the quotient. Find the quotients to the nearest whole number.

1. $1.8\overline{)73.8}$ 2. $.473\overline{)2838}$ 3. $5.46\overline{)32.76}$

4. $.591\overline{)2364}$ 5. $.93\overline{)9.1698}$ 6. $1.87\overline{)1178.1}$

Divide: Find quotients to the nearest tenth.

7. $.048\overline{)18.217}$ 8. $.79\overline{)298}$ 9. $5.92\overline{)9.64}$

10. $8.68\overline{)365.9}$ 11. $5.6\overline{)2.856}$ 12. $19\overline{)25.81}$

Divide: Find quotients to nearest hundredth.

13. $3.14\overline{)8.49}$ 14. $.061\overline{)14}$ 15. $13\overline{)56.3}$

16. $1.853\overline{)9.647}$ 17. $4.5\overline{)144.8}$ 18. $15\overline{)2113}$

Answer to problem in Introduction to the Student

It would take you about 4 seconds to enter the numbers into the machine. It would take the machine 5 seconds to give the answe

Total time: 9 seconds

Chapter III

FRACTIONS

CHAPTER III
Fractions

3-1 Locating the Decimal Point in an Indicated Division

You probably have noticed that the calculator has no keys marked for fractions. Does this mean that you will not be able to do examples having fractions using the machine? The answer is that you can do fraction work, and as a matter of fact, the examples will now be much easier to do.

Of course, the calculator cannot think by itself, for it is just a machine. It is very happy to do the tiresome computations for you, but it leaves the planning and decisions for you. You have already seen, for example, that the machine does not place decimal points in your answers. You are responsible for that.

Since the calculator cannot handle fractions directly, you must change them into a form that it can handle, that is, into decimal numbers. You remember that to change a fraction to decimal form, you must divide the numerator by the denominator. Fractions like $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{10}$, etc. are called proper fractions because the numerator is less than the denominator. When the numerator is larger than the denominator, as in $\frac{5}{3}$, $\frac{7}{2}$, $\frac{10}{7}$, $\frac{22}{9}$, etc. the numbers are called improper fractions.

A little practice in locating the decimal point in the answer to a division example might be worthwhile now. To help you understand the idea better, you will be asked to use pencil and paper for the next set of examples.

Examples: Determine, by pencil and paper, where the decimal point belongs in the following divisions. (A fraction indicates division.)

1. $\frac{3}{8}$

   Solution: $\begin{array}{r} .3 \\ 8\overline{)\,3.00} \end{array}$

2. $\frac{5}{16}$

   Solution: $\begin{array}{r} .3 \\ 16\overline{)\,5.00} \end{array}$

3. $\frac{2}{39}$

   Solution: $\begin{array}{r} .05 \\ 39\overline{)\,2.00} \end{array}$

4. $\frac{16}{1101}$

   Solution: $\begin{array}{r} .01 \\ 1101\overline{)\,16.000} \end{array}$

You only need to do the division until you reach the first non-zero digit.

3-1 EXERCISES: Using pencil and paper, locate the decimal point in the following quotients.

1. $\frac{1}{2}$
2. $\frac{2}{3}$
3. $\frac{5}{8}$
4. $\frac{1}{7}$
5. $\frac{3}{5}$
6. $\frac{4}{9}$
7. $\frac{5}{6}$
8. $\frac{9}{10}$
9. $\frac{3}{11}$
10. $\frac{5}{12}$
11. $\frac{4}{15}$
12. $\frac{2}{17}$
13. $\frac{6}{25}$
14. $\frac{7}{30}$
15. $\frac{5}{91}$
16. $\frac{8}{70}$
17. $\frac{3}{100}$
18. $\frac{7}{200}$
19. $\frac{9}{312}$
20. $\frac{11}{300}$
21. $\frac{16}{25}$
22. $\frac{42}{100}$
23. $\frac{55}{102}$
24. $\frac{91}{250}$
25. $\frac{29}{350}$
26. $\frac{502}{2100}$
27. $\frac{19}{1500}$
28. $\frac{560}{5000}$
29. $\frac{482}{1692}$
30. $\frac{16}{925}$
31. $\frac{405}{90000}$
32. $\frac{365}{45000}$

33. $\frac{119}{26835}$ 35. $\frac{2565}{32962}$ 37. $\frac{3827}{152135}$ 39. $\frac{9105}{300625}$

34. $\frac{3720}{56800}$ 36. $\frac{5268}{92121}$ 38. $\frac{7624}{126814}$ 40. $\frac{7109}{507281}$

3-2 Changing Proper Fractions to Decimals

To change a fraction to decimal form, you must divide the numerator by the denominator. You have learned how to divide one number by another by machine, so this will be no new problem. Be sure you put the <u>numerator</u> in first, for that will always be your <u>dividend</u>. After the division is done, you must use the rule you learned in Chapter Two to locate the decimal point in your quotient.

Example 1: Find the decimal value of $\frac{2}{7}$ to the nearest hundredth.

Solution: a) Since you want the answer to hundredths, you must carry the division to thousandths, or 3 decimal places. This means we must add 3 zeros to 2.

b) Punch 2 and 3 zeros and the dividend bar.

c) Punch 7 and then the division key.

Your tape will now read:

```
2000  +
2000  :
   7  :
 285  T
   5  T
```

<u>You read this</u>: 285 with a remainder of 5.

d) Because the numbers you were dividing were both whole numbers, you can use the vertical line idea to place your decimal point.

```
2|000  +
2|000  :
 |  7  :
 ↓
 .285  T
    5  T
```

You obtain .285, which when rounded off gives .29. Then we write $\frac{2}{7} = .29$ Answer.

Example 2: Find the decimal value of $\frac{13}{250}$ to two decimal places.

Solution: a) Since the answer is to be accurate to 2 decimal places, you must carry the division to 3 places. Therefore you add 3 zeros to 13.

b) Punch 13 and 3 zeros and then the dividend bar.

c) Punch 25 and 1 zero and the divisor key.

Your tape should read:

```
1 3 0 0 0   +
1 3 0 0 0   :
    2 5 0   :
      5 2   T
            T
```

This is read 52 with a 0 remainder.

d) Use your vertical line idea to place the decimal point, since the numbers being divided were whole numbers.

```
1 3,0 0 0   +
1 3|0 0 0   :
   |2 5 0   :
   ↓
   .  5 2   T
            T
```

You obtain .052 because you must put the 0 in the empty space. Rounded off this becomes .05. You write $\frac{13}{250} = .05$ Ans.

3-2 EXERCISES: Find the quotients to the nearest hundredth of the examples in 3-1 Exercises, using the calculator.

3-3 Changing Improper Fractions to Decimals

An improper fraction is a fraction which has a numerator greater than the denominator, such as $\frac{5}{4}$, $\frac{22}{7}$, $\frac{12}{3}$, $\frac{9}{1}$, etc. The decimal value of such fractions is always greater than 1, that is, there is a whole number part and a decimal part. What is the whole number part of a proper fraction?

The decimal value of improper fractions can be found by longhand division.

Example 1: Find the value of $\frac{15}{7}$ to the nearest hundredth longhand.

Solution:
$$\begin{array}{r} 2.142 \\ 7\overline{)15.000} \\ \underline{14} \\ 10 \\ \underline{7} \\ 30 \\ \underline{28} \\ 20 \\ \underline{14} \end{array}$$

The whole number part is 2. The decimal part is .142 Rounded off to hundredths: 2.14 Answer.

Example 2: Find the value of $\frac{18}{5}$ to the nearest hundredth longhand.

Solution:
$$\begin{array}{r} 3.600 \\ 5\overline{)18.000} \\ \underline{15} \\ 30 \\ \underline{30} \\ 0 \end{array}$$

The whole number part is 3. The decimal part is .600. Rounded off to hundredths: 3.60 Answer

3-3 EXERCISE A: Find the value of the following improper fractions to the nearest hundredth longhand.

1. $\frac{13}{7}$
2. $\frac{18}{8}$
3. $\frac{14}{9}$
4. $\frac{12}{7}$
5. $\frac{17}{12}$
6. $\frac{4}{3}$
7. $\frac{9}{8}$
8. $\frac{16}{5}$
9. $\frac{42}{7}$
10. $\frac{17}{3}$
11. $\frac{25}{12}$
12. $\frac{92}{16}$
13. $\frac{29}{15}$
14. $\frac{40}{19}$
15. $\frac{33}{26}$
16. $\frac{77}{14}$
17. $\frac{96}{25}$
18. $\frac{102}{15}$
19. $\frac{215}{33}$
20. $\frac{193}{42}$

To find the decimal values of improper fractions by machine, follow your regular rules for division.

Example 1: Find the decimal value of $\frac{251}{92}$ to the nearest hundredth by machine.

Solution: a) To find the answer to the nearest hundredth means carrying the division to thousandths. therefore you must add 3 zeros to the 251.

b) Press 251, then 3 zeros, then the dividend bar.

c) Press 92 and the division key.

Your tape should read:

```
251000  +
251000  :
    92  :
  2728  T
    24  T
```

This means 2.728 with a remainder of 24.

d) Youw answer becomes 2.73 when rounded off to hundredths. Write: $\frac{251}{92} = 2.73$ Answer

Be careful about the decimal point. If you are dividing only whole numbers, use the vertical line idea.

3-3 EXERCISE B: Do the examples of 3-3A but use the calculator.

3-4 Mixed Numbers

As you can see by the name, mixed number, such a number is a mixture of a whole number and a fraction. We use mixed numbers in many every day conversations, as 4½ days, 2¼ pounds, 5½ per cent, $5\frac{3}{4}$ feet, and so forth.

Probably the simplest way of finding the decimal value of mixed numbers is to find the decimal value of the fraction and then add it to the whole number part. For instance, 4½ becomes 4.5 since ½ = .5 and we add it to the whole number 4.

We can change mixed numbers to decimal numbers in longhand in the following way.

Example 1: Find the decimal equivalent of $7\frac{1}{15}$ to the nearest hundredth longhand.

Solution: a) Find the decimal value of $\frac{1}{15}$ to thousandths:

$$\begin{array}{r} .066 \\ 15\overline{)1.000} \\ \underline{90} \\ 100 \\ \underline{90} \\ 10 \end{array}$$

b) Round off .066 to hundredths: .07

c) Add .07 to 7 and get 7.07 Answer

3-4 EXERCISE A: Find the decimal values of the following mixed numbers longhand to the nearest hundredth.

1. $4\frac{1}{6}$
2. $3\frac{2}{5}$
3. $6\frac{1}{8}$
4. $12\frac{5}{8}$
5. $9\frac{3}{7}$
6. $1\frac{4}{15}$
7. $10\frac{5}{12}$
8. $19\frac{1}{4}$
9. $3\frac{10}{13}$
10. $100\frac{6}{7}$
11. $227\frac{5}{9}$
12. $49\frac{8}{17}$
13. $71\frac{12}{15}$
14. $806\frac{1}{17}$
15. $240\frac{2}{39}$
16. $1000\frac{5}{61}$
17. $1\frac{2}{57}$
18. $2\frac{1}{105}$
19. $6\frac{2}{205}$
20. $1\frac{7}{500}$

Of course, you can use the calculator to find the decimal value of the fraction part of the mixed number. Then you just add this decimal to the whole number part.

Example 1: Find the decimal value of $3\frac{13}{16}$ to nearest hundredth by machine.

Solution: a) Find the decimal value of $\frac{13}{16}$ by dividing 13.000 by 16. Your answer rounded to hundredths should be .81

b) Add .81 to the whole number part 3 and get 3.81 Answer

3-4 EXERCISE B: Do the same examples in 3-4A but use the calculator this time.

3-5 Changing Mixed Numbers to Improper Fractions

Does $\frac{2}{1} = 2$? Does $\frac{4}{2} = 2$? Does $\frac{6}{3} = 2$?

How many other indicated divisions can be used to write the number 2?

You could organize all the possible ways like this: $2 = \frac{2}{1} = \frac{4}{2} = \frac{6}{3} = \frac{8}{4} = \frac{10}{5} = \ldots\ldots\ldots$ In the same way, you could represent the number 3 like this: $3 = \frac{3}{1} = \frac{6}{2} = \frac{9}{3} = \frac{12}{4} = \frac{15}{5} \ldots\ldots$

Notice that you use the same denominators each time: 1, 2, 3, 4, ... To help you see that any whole number can be written as an improper fraction in countless ways, try the following exercise.

3-5 EXERCISE A: Write the following numbers as improper fractions using the denominators 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1. 2
2. 5
3. 6
4. 4
5. 10
6. 12
7. 8
8. 3
9. 1
10. 11

Since any whole number can be written as an improper fraction, we make use of this fact to change a mixed number to an improper fraction. For instance, we know that $5 = \frac{20}{4}$. Therefore to change $5\frac{3}{4}$ to an improper fraction we think $5\frac{3}{4} = 5 + \frac{3}{4} = \frac{20}{4} + \frac{3}{4} = \frac{23}{4}$.

Example 1: Change $7\frac{2}{3}$ to an improper fraction.

Solution: a) Since the fraction has a denominator of 3, we change 7 to an improper fraction having a denominator of 3. Thus $7 = \frac{21}{3}$.

b) $7\frac{2}{3} = 7 + \frac{2}{3} = \frac{21}{3} + \frac{2}{3} = \frac{23}{3}$

$7\frac{2}{3} = \frac{23}{3}$ Answer

An easier way to change a mixed number to an improper fraction is to use the idea explained above, but to do the work mentally.

Example 2: Change $5\frac{7}{9}$ to an improper fraction.

Solution: a) Multiply 9 by 5 and then add 7 to get 52.

b) Put the result, 52, over the denominator, 9, and obtain $\frac{52}{9}$.

Write: $5\frac{7}{9} = \frac{52}{9}$ Answer

Example 3: Change $12\frac{2}{5}$ to an improper fraction.

Solution: a) Multiply 12 by 5 and then add 2 to obtain 62.

b) Put the result, 62, over the denominator 5 to get $\frac{62}{5}$.

Write: $12\frac{2}{5} = \frac{62}{5}$ Answer

3-5 EXERCISE B: Change the following mixed numbers to improper fractions by the method used in Examples 2 and 3 above.

1. $4\frac{1}{4}$
2. $7\frac{3}{5}$
3. $6\frac{7}{9}$
4. $10\frac{1}{2}$
5. $12\frac{2}{3}$
6. $11\frac{3}{7}$
7. $15\frac{1}{4}$
8. $19\frac{3}{4}$
9. $16\frac{2}{3}$
10. $12\frac{4}{7}$
11. $6\frac{3}{11}$
12. $4\frac{2}{15}$
13. $7\frac{3}{10}$
14. $2\frac{5}{32}$
15. $1\frac{9}{100}$
16. $2\frac{3}{151}$
17. $8\frac{2}{13}$
18. $4\frac{13}{16}$
19. $9\frac{15}{22}$
20. $7\frac{9}{250}$

3-6 Multiplying With Fractions

It will help if you now review some examples involving multiplying by fractions. The following types of examples should be included.

A Fraction by Fraction: $\frac{2}{3} \times \frac{5}{7}$

Solution: $\frac{2}{3} \times \frac{5}{7} = \frac{10}{21} = .48$

B Fraction by Whole Number: $\frac{3}{8} \times 21$

Solution: $\frac{3}{8} \times 21 = \frac{3}{8} \times \frac{21}{1} = \frac{63}{8} = 7.88$

C Fraction by Mixed Number: $\frac{2}{3} \times 5\frac{2}{13}$

Solution: $\frac{2}{3} \times 5\frac{2}{13} = \frac{2}{3} \times \frac{67}{13} = \frac{134}{39} = 3.44$

D Mixed Number by Mixed Number: $5\frac{3}{4} \times 2\frac{1}{2}$

Solution: $5\frac{3}{4} = \frac{23}{4}$, $2\frac{1}{2} = \frac{5}{2}$

Therefore $5\frac{3}{4} \times 2\frac{1}{2} = \frac{23}{4} \times \frac{5}{2} = \frac{115}{8}$

$\frac{115}{8} = 14.38$

Notice that each of the divisions has been rounded off to hundredths.

Use the following rule whenever you are multiplying fractions by fractions, whole numbers, or mixed numbers.

RULE: When multiplying fractions by whole numbers, mixed numbers or fractions:

1. Change all numbers to fraction form.
2. Multiply the numerators, then multiply the denominators.
3. Divide the resulting numerator by the denominator to correct decimal value.

3-6 EXERCISE A: Using paper and pencil, multiply the following numbers and leave your answers in decimal form to nearest hundredth.

1. $\frac{2}{5} \times 14$
2. $14 \times \frac{5}{7}$
3. $\frac{3}{4} \times \frac{7}{8}$
4. $\frac{10}{13} \times \frac{16}{3}$
5. $5\frac{1}{2} \times 7$
6. $2\frac{2}{3} \times 1\frac{1}{2}$
7. $9 \times 5\frac{1}{4}$
8. $\frac{7}{12} \times 2\frac{1}{5}$
9. $5\frac{3}{7} \times 1\frac{1}{2}$
10. $60 \times 4\frac{2}{5}$
11. $9\frac{1}{3} \times 7\frac{1}{2}$
12. $42 \times \frac{7}{13}$
13. $\frac{5}{6} \times \frac{23}{18}$
14. $2\frac{3}{5} \times 79$
15. $1\frac{15}{16} \times 2\frac{1}{3}$
16. $18\frac{2}{3} \times 7$
17. $12\frac{3}{8} \times 4\frac{2}{\ }$[illegible]
18. $10 \times \frac{15}{29}$
19. $42\frac{2}{11} \times 7\frac{1}{7}$
20. $19\frac{3}{16} \times \frac{4}{5}$

When you use the machine to multiply fractions, you use the same rule as before:

RULE: 1. Change all numbers to fraction form

2. Multiply all numerators, then all denominators.

3. Divide the resulting numerator by the denominator to desired accuracy.

Example 1: Multiply $\frac{7}{16} \times 925$ to the nearest hundredth.

Solution: Think $\frac{7}{16} \times \frac{925}{1}$

a) Multiply 7 by 925 and get 6475.

b) Multiply 16 by 1 mentally and get 16.

c) Divide 6475 000 by 16 and get 404687.

d) Place decimal point 404.687 and round off: 404.69 Answer

Example 2: Multiply $5\frac{2}{7} \times 61\frac{3}{4}$ to nearest hundredth.

Solution: a) Write on paper $\frac{37}{7} \times \frac{247}{4}$

b) Multiply 37 by 247 to get 9139.

c) Multiply 7 by 4 mentally to get 28.

d) Divide 9139 by 28 to get 326392.

e) Place decimal point 326.392 and round off: 326.39 Answer

Whenever you are in doubt about a mental calculation, as in changing $61\frac{3}{4}$ to $\frac{247}{4}$, do the multiplication in the machine. Remember, it takes just one wrong number to make the entire example wrong!

Example 3: Multiply $19\frac{12}{17} \times 243$ to the nearest hundredth.

Solution: a) Multiply 17 by 19 to get 323 and then add 12 to get 335.

b) Think $\frac{335}{17} \times \frac{243}{1}$.

c) Multiply 335 by 243 to get 81405.

d) Multiply 17 by 1 mentally to get 17.

e) Divide 81405 by 17 to get 4788529.

f) Place decimal point 4788.529 and round off: 4788.53 Answer

3-6 EXERCISE B: Do the examples in 3-6 Exercise A using the calculator. You will need paper to write the examples in fraction form.

OPTIONAL TOPIC

3-7 Repeating Decimals and Terminating Decimals

There are some fractions that you probably feel very sure of, such as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{9}{10}$, and so on. For fractions like these, we can find exact decimal values. For example, we know from past work that $\frac{1}{2} = .5$, $\frac{1}{4} = .25$ and $\frac{3}{8} = .375$ exactly.

If you were to divide longhand to get the decimal value of $\frac{3}{8}$ by dividing 8 into 3, you would find that the division terminates, or ends, when you get to .375 because you would have obtained a zero remainder. If you get a zero remainder, you have what is called a terminating decimal.

Example 1: Can $\frac{5}{16}$ be written as a terminating decimal?

Solution: By longhand division

$$\begin{array}{r} .3125 \\ 16\overline{)5.0000} \\ \underline{4\,8} \\ 20 \\ \underline{16} \\ 40 \\ \underline{32} \\ 80 \\ \underline{80} \\ 0 \end{array} \swarrow \text{Remainder is ZERO}$$

You see that the division resulted in a zero remainder. Then you say $\frac{5}{16}$ can be written as a terminating decimal.

Doing the same example by machine poses a little problem. How many zeros should you use in the dividend? In other words, how do you know how far you have to divide to see if there is a zero remainder? You realize, of course, that once you reach a 0 remainder that all the digits in your quotient will be 0 from that point on. So really it doesn't matter if you add too many zeros to your dividend, since you will be able to see a string of zeros in your quotient. Therefore when doing the problem by machine just add as many zeros to your dividend as is possible.

Example 2: Can $\frac{5}{16}$ be written as a terminating decimal? (Do by machine)

Solution: a) Punch 5 and 12 zeros (the machine will print only 11.)

b) Punch the dividend key.

c) Punch 16 and then the division key.

d) Your answer reads .31250000000 and a remainder of 0.

Since you have obtained a 0 remainder, you conclude that $\frac{5}{16}$ can be written as a terminating decimal.

3-7 EXERCISE A: Use the method of Example 2, above, to decide, by machine, whether the following fractions can be written as terminating decimals.

1. $\frac{15}{24}$
2. $\frac{7}{16}$
3. $\frac{382}{1000}$
4. $\frac{24}{40}$
5. $\frac{221}{2000}$
6. $\frac{1111}{2500}$
7. $\frac{87}{125}$
8. $\frac{113}{250}$
9. $\frac{16}{625}$
10. $\frac{303}{625}$

Now there are also fractions which do not have exact decimal values. Some of the most familiar of these are $\frac{1}{3}$, $\frac{1}{6}$, $\frac{2}{3}$, $\frac{5}{6}$. No matter how far you carry the division of $\frac{1}{3}$, that is 3 divided into 1, you find that the remainder never becomes 0. In fact, you obtain a string of 3's! When you divide 1 by 6, that is, when you find the decimal value of $\frac{1}{6}$, what do you find? Your answer comes out .1666.....; the 6 repeats itself endlessly. Decimals like these are called repeating decimals. The fractions $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{6}$, $\frac{5}{6}$ are equivalent to repeating decimals.

Sometimes it is a long job to find out whether a fraction is equal to a repeating decimal. Consider the fraction $\frac{2}{7}$. Dividing longhand we get:

```
       .285714
  7/ 2.000000
     14
      60
      56
       40
       35
        50
        49
         10
          7
          30
          28
           2
```

REMAINDER is 2 - the same number as the original dividend

Whenever you get a remainder which is the same as your orginal dividend, do you see that you are really beginning the example over again? The digits will now repeat themselves in the quotient so you will obtain .<u>285714</u> <u>285714</u> <u>285714</u>.... The division never ends! Therefore $\frac{2}{7}$ can never be expressed as an exact decimal, but can only be approximated. Such fractions as $\frac{2}{7}$ are equal to <u>repeating</u> <u>decimals</u>.

Let us take the same fraction $\frac{2}{7}$ and carry out the division still further to see another interesting fact.

```
     .285714285714
  7|2,00000000000000
    14
     60
     56
      40
      35
       50
       49
        10
         7
         30
         28
         20
         14
          60
          56
           40
           35
            50
            49
             10
              7
              30
              28
               2
```

REMAINDER IS EQUAL TO ORIGINAL DIVIDEND

REMAINDER IS THE SAME AS A <u>PREVIOUS</u> REMAINDER, 2

Notice the remainder has repeated itself.

Summary:

A fraction is equivalent to a repeating decimal if one of the following is true:

1. The remainder is the same as the original dividend at any step.
2. The remainder becomes exactly the same as some other previous remainder.

To illustrate the second case by machine, let us see whether $\frac{5}{12}$ is equal to a repeating decimal.

Example: Show by method of repeating remainders that $\frac{5}{12}$ is equal to a repeating decimal.

Solution:

a) First try 5 with no zeros divided by 12. Your remainder is 5.

b) Now try 5 with 1 zero divided by 12. Your remainder is 2.

NOTICE THE REMAINDER HAS REPEATED

c) Now try 5 with 2 zeros divided by 12. Your remainder is 8.

d) Now try 5 with 3 zeros divided by 12. Your remainder is 8.

You see that the remainder has repeated itself in steps c and d. Thus you may conclude that $\frac{5}{12}$ is equivalent to a repeating decimal ($\frac{5}{12} = .4166.....$)

Of course the method just used is rather long. You have to make repeated trials with one zero, two zeros, three zeros, etc. until you come to a remainder which is the same as a previous one. In actual practice, you will use a different technique, which you will study in the next section.

Summary: 1. A fraction is equivalent to a terminating decimal if the remainder ever becomes 0.

2. A fraction is equivalent to a repeating decimal if:

   a) the remainder ever is the same as the original dividend.

   b) the remainder ever becomes the same as a previous remainder.

It will be useful to our understanding to try the following problems by longhand division before you take up the machine method.

3-7 EXERCISE B: By actual longhand division, decide whether the following fractions are equivalent to terminating or repeating decimals.

1. $\frac{2}{9}$
2. $\frac{5}{6}$
3. $\frac{3}{8}$
4. $\frac{1}{11}$
5. $\frac{7}{12}$
6. $\frac{3}{10}$
7. $\frac{10}{15}$
8. $\frac{5}{16}$
9. $\frac{2}{11}$
10. $\frac{5}{12}$
11. $\frac{1}{6}$
12. $\frac{4}{15}$
13. $\frac{7}{20}$
14. $\frac{3}{11}$
15. $\frac{1}{16}$
16. $\frac{5}{9}$

*17. $\frac{5}{14}$

18. $\frac{7}{11}$
19. $\frac{7}{15}$

*20. $\frac{3}{14}$

* VERY LONG DIVISIONS.

As mentioned earlier, there is a method you can use in actual practice which makes it easier to decide whether a fraction is equal to a repeating or terminating decimal. The machine makes it a fairly simple process. What you do is add as many zeros as is possible to the dividend, (no matter how many zeros you punch, only a number having 12 digits can be written) and then divide.

If the decimal is repeating, you can usually spot the pattern of repeating digits immediately. For example, you can easily see the repeating digits in 2135 35 35 35 35 35, or in 243105 105 105. All you have to do is look at your printed quotient on the tape to decide whether there is a repeating pattern.

Example: Is $\frac{5}{13}$ a repeating or a terminating decimal equivalent?

Solution:
a) Punch 5 and 11 zeros, then the dividend bar.
b) Punch 13, then the division bar.
c) Read the quotient:

   384615 38461 T

   7 T

d) Since you are not sure of the next digit following 1, take the remainder 7, and divide it by 13 again. This will give you the next digit in your division.
e) Punch 7 and 1 zero and then the dividend bar.
f) Punch 13 and then division key.
g) Read the quotient:

   5 T

   5 T

h) Put the quotients of step c and g together to obtain 384615 384615
i) Since the digits form a repeating pattern you conclude that $\frac{5}{13}$ is equal to a repeating decimal.

3-7 EXERCISE C: Use the method just explained to decide which of the following fractions are equivalent to repeating decimals.

1. $\frac{2}{5}$
2. $\frac{7}{9}$
3. $\frac{3}{4}$
4. $\frac{5}{7}$
5. $\frac{5}{9}$
6. $\frac{2}{11}$
7. $\frac{3}{7}$
8. $\frac{11}{12}$
9. $\frac{4}{13}$
10. $\frac{6}{11}$
11. $\frac{9}{16}$
12. $\frac{6}{13}$
13. $\frac{4}{7}$
14. $\frac{5}{6}$
15. $\frac{10}{13}$
16. $\frac{13}{14}$
17. $\frac{3}{11}$

*18. $\frac{12}{17}$

*19. $\frac{41111}{333000}$

*20. $\frac{231284}{333000}$

* In examples 18, 19, and 20 you will have to divide twice.

3-8 Review Exercises

1. Does the calculator print decimal points?
2. Can you punch into the machine a number like .0025?
3. What is the rule you use for placing the decimal point in your answer when dividing two whole numbers?
4. Consider the examples below:

   a) $\frac{250}{361}$ b) $\frac{25}{3.61}$ c) $\frac{.25}{.0361}$ d) $\frac{.0025}{3.61}$

   i) Are the answers going to be the same?

   ii) What will be the same about the answers?

   iii) Has this got anything to do with doing an example like $\frac{.0025}{.361}$ in the machine?
5. What is the rule you use for placing the decimal point in your answer when the numbers you are dividing are not both whole numbers?

6. In which decimal place does the first non-zero digit occur when dividing:

a) $\frac{4}{5}$ c) $\frac{2}{97}$ e) $\frac{25}{6025}$

b) $\frac{3}{40}$ d) $\frac{37}{192}$ f) $\frac{371}{19354}$

7. In which decimal place does the first non-zero digit occur when dividing:

a) $\frac{1.5}{.36}$ c) $\frac{.0092}{3.6}$ e) $\frac{.0936}{32.8}$

b) $\frac{.224}{35}$ d) $\frac{42.9}{.306}$ f) $\frac{1.007}{42.9}$

8. Find the value to the nearest hundredth by longhand method:

a) $\frac{5}{16}$ c) $\frac{36}{17}$ e) $\frac{601}{351}$

b) $\frac{12}{19}$ d) $\frac{42}{15}$ f) $\frac{2010}{9055}$

9. Use the calculator to do the examples in # 8.

10. Find the decimal values of the following numbers by longhand method: (nearest hundredth)

a) $20\frac{5}{9}$ c) $900\frac{4}{7}$ e) $6\frac{200}{702}$

b) $2\frac{63}{65}$ d) $19\frac{8}{39}$ f) $1\frac{6}{2500}$

11. Do example # 10 by machine.

12. Change the following mixed numbers to improper fractions:

a) $11\frac{1}{3}$ c) $23\frac{15}{17}$ e) $75\frac{43}{151}$

b) $16\frac{7}{9}$ d) $410\frac{2}{11}$ f) $206\frac{416}{900}$

13. Change the following improper fractions to mixed numbers:

a) $\frac{943}{452}$ c) $\frac{108}{17}$ e) $\frac{9215}{167}$

b) $\frac{75}{13}$ d) $\frac{4054}{63}$ f) $\frac{4506}{27}$

14. Using longhand methods, multiply the following: (Leave answers in fraction form.)

a) $\frac{5}{12} \times 163$ c) $9\frac{1}{8} \times 725$ e) $\frac{17}{91} \times \frac{43}{60}$

b) $4\frac{1}{7} \times 68\frac{2}{5}$ d) $8060 \times 42\frac{1}{3}$ f) $\frac{26}{47} \times 19\frac{3}{16}$

15. Do example 14 by machine.

16. (Optional)

RENAME THE FIRST NUMBER

I. 24 = 4 x _____ = _____ x 2 = _____ x 1 = 3 x _____
II. 30 = 6 x _____ = 2 x _____ = 10 x _____ x 3 = 2 x 3 x _____
III. 72 = _____ x 9 = 6 x _____ = 2 x 9 x _____ = 3 x _____
IV. 45 = 3 x _____ = 5 x _____ = _____ x 45 = 3 x _____ x 5 = 9 x _____
V. 64 = 8 x _____ = 4 x _____ x 4 = 2 x _____ = 2 x 2 x 2 x 2 x 2 x _____
VI. 4 = 16 ÷ _____ = 12 ÷ _____ = 40 ÷ _____ = _____ ÷ 7
VII. 10 = _____ ÷ 3 = _____ ÷ 10 = 70 ÷ _____ = 140 ÷ _____
VIII. 7 = 21 ÷ _____ = 70 ÷ _____ = 7 ÷ _____ = _____ ÷ 5
IX. 12 = _____ ÷ 2 = _____ ÷ 5 = _____ ÷ 7 = _____ ÷ 10
X. 15 = 15 ÷ _____ = 135 ÷ _____ = 105 ÷ _____

÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷ ÷

Chapter IV

PER CENT

CHAPTER IV
Per Cent

4-1 Meaning of Per Cent

Per cent is another name for $\frac{1}{100}$, .01, or hundredths. The symbol for per cent is %.

Example 1: What does 30% mean?

Solution: 30% means $30 \times \frac{1}{100} = \frac{30}{100}$

Example 2: What does 75% mean?

Solution: 75% means $75 \times \frac{1}{100} = \frac{75}{100}$

Example 3: What does 2% mean?

Solution: 2% means $2 \times \frac{1}{100} = \frac{2}{100}$

4-1 EXERCISES A: Change the following per cents to fractions in this manner:

1. 10% means ____ $\times \frac{1}{100} = \frac{\quad}{100}$
2. 37% means ____ $\times \frac{1}{100} = \frac{\quad}{100}$
3. 99% means ____ $\times \frac{1}{100} = \frac{\quad}{100}$
4. 3% means ____ $\times \frac{1}{100} = \frac{\quad}{100}$

Do you see an easy way of doing these?

To change a per cent to a fraction, remove the per cent symbol and put the number over 100.

Example 1: Change 44% to a fraction.

Solution: $44\% = \frac{44}{100}$

Note: The fraction $\frac{44}{100}$ does not have a % symbol written next to it.

Example 2: Change 1% to a fraction.

Solution: $1\% = \frac{1}{100}$

4-1 EXERCISES B: Change the following per cents to fractions using this method:

1. $3\% = \overline{100}$

2. $85\% = \overline{100}$

3. $57\% = \overline{100}$

You will recall that a fraction such as $\frac{35}{100}$ can be written in decimal form as .35. Using this idea, we can also write per cents as decimals.

Example 1: Change 15% to a decimal.

Solution: 15% means $\frac{15}{100} = .15$

Example 2: Change 92% to a decimal.

Solution: 92% means $\frac{92}{100} = .92$

Example 3: Change 1% to a decimal.

Solution: 1% means $\frac{1}{100} = .01$

Note: We must add a zero in this case.

4-1 EXERCISES C: Change the following per cents to decimals:

1. 72% = $\frac{\ }{100}$ = .____

2. 3% = $\frac{\ }{100}$ = .____

3. 37% = $\frac{\ }{100}$ = .____

Do you see an easy way of doing these?

To change a per cent to a decimal, remove the per cent symbol and move the decimal point two places to the left.

Example 1: Change 32% to a decimal.

Solution: 32% = .32

Note: Remember that the decimal point in a whole number is to the right of the ones place. In the number 32, 2 is in the ones place, therefore, the decimal is to the right of 2.

Example 2: Change 17% to a decimal.

Solution: 17% = .17

Example 3: Change 50% to a decimal.

Solution: 50% = .50

Example 4: Change 5% to a decimal.

Solution: 5% = .05

Note: In order to move the decimal to the left in this case, we had to add a zero to the left of 5.

Example 5: Change 3% to a decimal.

Solution: 3% = .03

Example 6: Change .3% to a decimal.

Solution: .3% = .003

4-1 EXERCISES D: Change the following per cents to decimals:

1. 8% = ______
2. 80% = ______
3. 62% = ______
4. 38% = ______
5. 2% = ______
6. 1.2% = ______
7. 22.5% = ______
8. 10.7% = ______

There are times when we must work with per cents such as $4\frac{1}{4}\%$. Recall that $\frac{1}{4} = .25$. (Divide 1 by 4.) Thus, $4\frac{1}{4}\% = 4.25\%$. But now, removing the per cent symbol and moving the decimal point two places to the left, we have $4\frac{1}{4}\% = .0425$.

Here are some more examples to illustrate this method:

1. $43\frac{1}{2}\% = 43.5\% = .435$
2. $7\frac{3}{4}\% = 7.75\% = .0775$

4-1 EXERCISES E: Change the following per cents to decimals.

1. $3\frac{1}{2}\%$
2. $62\frac{1}{4}\%$
3. $20\frac{1}{5}\%$
4. $8\frac{1}{8}\%$

4-1 EXERCISES F: Change the following per cents to decimals.

1. 55%
2. 5.5%
3. $5\frac{1}{2}\%$
4. 91%
5. $3\frac{3}{4}\%$
6. 37%
7. 1.9%
8. 1.09%
9. 1.1%
10. $1\frac{1}{10}\%$
11. $13\frac{1}{2}\%$
12. 4.2%
13. 10.5%
14. $5\frac{1}{4}\%$
15. 50%
16. $10\frac{1}{2}\%$
17. $3\frac{1}{4}\%$
18. 5.15%
19. $2\frac{1}{2}\%$
20. $23\frac{1}{4}\%$

4-2 Finding the Per Cent of a Number

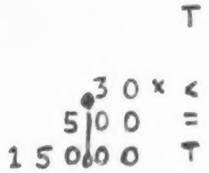
To find a given percent of a number, change the per cent to a decimal and multiply by the number.

Example 1: Find 30% of 500.

Solution: a) 30% = .30

b) .30 x 500 = 150 (answer)

(See tape, right.)

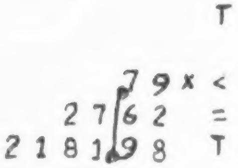


Example 2: Find 79% of $2762.

Solution: a) 79% = .79

b) .79 x 2762 = $2181.98

(See tape, right.)



When working problems dealing with per cents, you must be very careful in locating the decimal point in the answer. At this point, you might wish to review multiplying with decimals as you did in Chapter 2. In all your work with per cents, put your decimal points on your tapes as you work through your example as was done above.

4-2 EXERCISES: Compute these amounts to the nearest hundredths.

1. 52% of 128
2. 6% of .2156
3. 79% of 83
4. 3½% of $27.50
5. 100% of 632
6. 10% of 632
7. 1% of 632
8. 99% of $437.89
9. 43.5% of 67
10. 2% of $38.11
11. .5% of 96
12. $33\frac{1}{3}$% of $248.24

4-3 Per Cents Greater Than 100%

What does 100% mean? Changing to a decimal we obtain 1.00 or 1. Thus, you may think of 100% as meaning <u>all</u> or the <u>whole</u> of something.

We often have occasion to use per cents greater than 100. To change a per cent greater than 100 to decimal form, you use the same method as in section 4-1. Namely:

<u>To change a per cent to a decimal, remove the per cent symbol and move the decimal point two places to the left</u>.

Example 1: Change 125% to a decimal.

Solution: 125% = 1.25

Example 2: Change 263% to a decimal.

Solution: 263% = 2.63

4-3 EXERCISES A: Change the following per cents to a decimal.

1. 175% = ______
2. 200% = ______
3. 1295%= ______
4. 321.5% = ______
5. 102% = ______
6. 150% = ______
7. 125% = ______
8. 250% = ______
9. 137% = ______
10. 205% = ______

To find a per cent of a number when the per cent is greater than 100 also requires the same method as in section 4-1. Namely,

<u>To find a given per cent of a number, change the per cent to a decimal and multiply this by the number</u>.

Example: Find 125% of 500.

Solution: a) 125% = 1.25

b) Your tape should look like this:

```
    1.2 5 x <
    5|0 0   =
6 2 5.0 0   T
```

c) Thus 125% of 500 = 625.

4-3 EXERCISES B: Compute these amounts to the nearest cent.

1. 110% of $95
2. 375% of $360
3. 132% of $118.50
4. 520% of $9280
5. 100% of $425
6. 1000% of $425
7. 200% of $425
8. 300% of $425
9. 2525% of $19.2
10. 103.5% of $25.20
11. 250% of $2.50
12. 250% of $250
13. 150% of $1000
14. 150% of $10
15. 100% of $100
16. 100% of $1
17. 100% of $.25
18. 125% of $846.34
19. 175% of $182.26
20. 115% of $23.07

4-4 Fractions of a Per Cent

There are times when we use per cents less than one per cent. We call these fractional per cents. An example would be ½%. Think of this as meaning ½ of 1%.

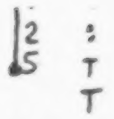
Again, to change a fractional per cent to a decimal simply requires removing the per cent symbol and moving the decimal point two places to the left.

Example: Change .7% to decimal form.

Solution: 7% = .007 = .007

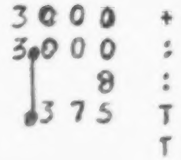
If a fractional per cent is in common fraction form, we can first change it to a decimal per cent and then change it to a decimal.

Example 1: Change $\frac{1}{2}\%$ to a decimal.



Solution: $\frac{1}{2}\% = .5\% = .005$

Example 2: Change $\frac{3}{8}\%$ to a decimal.



Solution: $\frac{3}{8}\% = .375\% = .00375$

4-4 EXERCISE A: Change the following fractional per cents to decimals.

1. $\frac{1}{4}\%$
2. $\frac{3}{4}\%$
3. $\frac{1}{5}\%$
4. $\frac{4}{5}\%$
5. $\frac{1}{8}\%$
6. $\frac{1}{2}\%$
7. $\frac{3}{5}\%$
8. $\frac{3}{8}\%$
9. $\frac{1}{3}\%$
10. $\frac{2}{5}\%$
11. $\frac{1}{6}\%$
12. $\frac{5}{6}\%$
13. $\frac{5}{8}\%$
14. $\frac{2}{3}\%$
15. $\frac{7}{8}\%$
16. $\frac{1}{7}\%$
17. $\frac{6}{7}\%$
18. $\frac{5}{9}\%$
19. $\frac{4}{8}\%$
20. $1\frac{1}{2}\%$

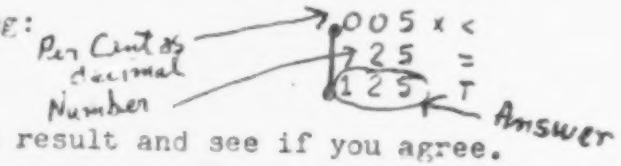
The problem of finding a fractional per cent of a number uses the same method as before. Namely, change the per cent to a decimal and multiply this by the number. Remember, put your decimal points on your tapes as you do these problems.

Example: Find $\frac{1}{2}\%$ of 25.

Solution: a) Changing $\frac{1}{2}\%$ to a decimal per cent gives .5%

b) In decimal form we then have .5% = .005

c) Multiplying:



d) Check this result and see if you agree. Note that two zeros have to be written on the tape for .005.

4-4 EXERCISES B: Find the following:

1. $\frac{1}{2}$ % of 100 (nearest tenth)

2. $\frac{3}{4}$ % of 400 (nearest unit)

3. $\frac{1}{4}$ % of 33 (nearest hundredth)

4. $\frac{1}{5}$ % of 25 (nearest hundredth)

5. $\frac{1}{8}$ % of $232.00 (Give answer to nearest cent.)

6. 1 $\frac{1}{2}$ % of 512 (nearest hundredth)

7. 15% of 512 (nearest tenth)

8. 115% of 512 (nearest tenth)

9. $\frac{1}{3}$ % of $25.60 (nearest cent)

10. $\frac{4}{5}$ % of .397 (sixth decimal place)

11. $\frac{3}{4}$ % of 920 (nearest hundredth)

12. 7.5% of 920 (nearest unit)

13. 75% of 920 (nearest unit)

14. 62 $\frac{1}{2}$ % of 5280 (nearest unit)

15. 135% of 625 (nearest hundredth)

16. 5.15% of $32.50

17. 3½% of $17.70

18. 103.5% of $17.70

19. ¼% of $5263

20. $\frac{5}{9}$ % of $237.75

4-5 Per Cents with Common Fractional Equivalents

Certain commonly used per cents are equivalent to common fractions. These fractions are sometimes more convenient to use in working out problems when a machine is not available.

Let us examine $12\frac{1}{2}\%$. In decimal form this would be .125. Also, if we take the fraction $\frac{1}{8}$ and convert it to a decimal we find it equals .125. It is clear then that since $12\frac{1}{2}\% = .125$ and $\frac{1}{8} = .125$, then $12\frac{1}{2}\% = \frac{1}{8}$.

Suppose we have the problem of finding $12\frac{1}{2}\%$ of 32. We can now proceed in either one of two ways.

Example: Find $12\frac{1}{2}\%$ of 32.

Solution: (Method 1)

a) $12\frac{1}{2}\% = .125$

b) Multiplying

```
        T
.1 2 5 x <
   3 2   =
4.0 0 0  T
```

c) Therefore 12.5% of 32 is 4.

Solution: (Method 2)

a) $12\frac{1}{2}\% = \frac{1}{8}$

b) Since $\frac{1}{8} \times 32 = \frac{32}{8}$, we have $\frac{32}{8} = 4$.

c) Therefore, again, $12\frac{1}{2}\%$ of 32 is 4.

<u>Notice that in each case, the result is the same</u>.

Listed below are some of the most commonly used per cents that have convienient fractional equivalents.

$10\% = \frac{1}{10}$

$12\frac{1}{2}\% = \frac{1}{8}$

$16\frac{2}{3}\% = \frac{1}{6}$

$20\% = \frac{1}{5}$

$25\% = \frac{1}{4}$

$30\% = \frac{3}{10}$

$33\frac{1}{3}\% = \frac{1}{3}$

$37\frac{1}{2}\% = \frac{3}{8}$

$40\% = \frac{2}{5}$

$50\% = \frac{1}{2}$

$60\% = \frac{3}{5}$

$62\frac{1}{2}\% = \frac{5}{8}$

$66\frac{2}{3}\% = \frac{2}{3}$

$70\% = \frac{7}{10}$

$75\% = \frac{3}{4}$

$80\% = \frac{4}{5}$

$83\frac{1}{3}\% = \frac{5}{6}$

$87\frac{1}{2}\% = \frac{7}{8}$

$90\% = \frac{9}{10}$

$100\% = 1$

You may wish to check some of these results by using your machine to convert the fractions to decimals and then to per cents.

4-5 EXERCISES: Find the following without the use of your machine by changing the per cents to the common fraction form and then multiplying. Show all your work.

Check your work by doing the same examples in decimal form using your machine.

1. 25% of 72
2. 70% of 350
3. $12\frac{1}{2}$% of 324
4. $87\frac{1}{2}$% of 512
5. 20% of 20.5
6. 175% of 2048
7. $66\frac{2}{3}$% of 48 (Do you get a different result in this example when you do it using the machine? Can you explain the difference in answers?)

Find the following using whichever method you prefer.

8. $37\frac{1}{2}$% of 112
9. 25% of 18
10. $62\frac{1}{2}$% of 37.6
11. 75% of $987 (Give answer to nearest cent.)
12. $83\frac{1}{3}$% of $5\frac{1}{2}$ (Give answer to nearest hundredth.)

4-6 Changing Fractions and Decimals to Per Cents

In order to change a decimal to a per cent, we simply reverse our process. To change a decimal to a per cent, move the decimal point two places to the right and write the per cent symbol.

Example 1: Change .57 to a per cent

Solution: .57 = 57%

Example 2: Change .325 to a per cent

Solution: .325 = 32.5%

Example 3: Change .07 to a per cent

Solution: .07 = 7%

Example 4: Change .9 to a per cent

Solution: .9 = 90%

Note: It is necessary to add a zero to the right in order to move the decimal 2 places to the right.

4-6 EXERCISES A: Change the following decimals to per cents.

1. .65 =
2. .02 =
3. .125 =
4. 1.36 =
5. $.87\frac{1}{2}$ =
6. .005 =
7. .05 =
8. .5 =
9. 5.0 =
10. 2.005 =

To change a fraction to a per cent, we can first change the fraction to a decimal and then use the method of the previous section. Recall that changing a fraction to a decimal requires dividing the numerator of the fraction by the denominator.

Here are some examples to illustrate this method:

Example 1: Change $\frac{1}{8}$ to a per cent.

Solution: By dividing 1 by 8 we obtain .125. Check this result on your machine. Moving the decimal point in .125 two places to the right and writing the per cent symbol we then have 12.5%. Thus, $\frac{1}{8}$ = 12.5%.

Example 2: Change $\frac{2}{9}$ to a per cent.

Solution: Dividing 2 by 9 we obtain the repeating decimal .222. (See tape.) Moving the decimal point two places to the right and rounding this to one decimal place we obtain 22.2%

```
            T

2.0 0 0 0   +
2.0 0 0 0   :
        9   :
 .2 2 2 2   T
        2   T
```

4-6 EXERCISES B: Change the following fractions to per cents, rounding your answer where necessary to one decimal place.

1. $\frac{1}{10}$ =

2. $\frac{4}{5}$ =

3. $\frac{1}{3}$ =

4. $\frac{5}{4}$ =

5. $\frac{5}{6}$ =

6. $\frac{7}{9}$ =

7. $\frac{1}{5}$ =

8. $\frac{1}{50}$ =

9. $\frac{1}{500}$ =

10. $1\frac{7}{8}$ =

4-7 Finding What Per Cent One Number Is of Another

One method of comparing two numbers requires finding what per cent one number is of another.

Example 1: 2 is what per cent of 5?

Solution: a) Notice the word "of." This indicates that 5, the number following "of", is to be the denominator of a fraction whose numerator is 2. Thus, we obtain $\frac{2}{5}$.

b) Changing this to a decimal we have $\frac{2}{5} = .40$

c) But .40 = 40%.

d) Therefore, 2 is 40% of 5.

Example 2: What per cent of 28 is 12?

Note: 28 follows "of" and therefore is the denominator.

Solution: a) $\frac{12}{28} = .4285$.

b) .4285 = 42.85 %.

c) Thus, 42.85% of 28 is 12.

To check your work, find 42.85% of 8 and see if it is 2.

4-7 EXERCISES: Find the following per cents. Carry all divisions to four decimal places and round your final answers to 3 decimal places.

1. ______% of 60 is 30?
2. ______% of 60 is 3?
3. ______% of 60 is .3?
4. ______% of 60 is 300?
5. ______% of 80 is 60?
6. ______% of 8 is 60?

7. ________% of 800 is 60?

8. ________% of $29.14 is $3.12?

9. What per cent of 2486 is 927?

10. What per cent of $1.00 is 33¢?

11. 78 is what per cent of 137?

12. 65 is what per cent of 195?

13. .6 is what per cent of 72?

14. .6 is what per cent of 720?

15. 3.6 is what per cent of 31.8?

4-8 Review Exercises

Completion: Fill in the blanks with the correct answer.

1. Per cent is another name for ________.

2. To change a per cent to a decimal ________ the per cent symbol and move the decimal point ____ places to the _____.

3. To find a given per cent of a number change the ________ to a ________ and ________ by the number.

4. To find what per cent one number is of another, divide the first number by the number following ________.

Change the following per cents to decimals:

5. 62%
6. 137%
7. ½%
8. .6%
9. 4.5%
10. 3¼%
11. 225½%
12. .003%
13. 27.13%
14. 37½%

FILMED FROM BEST AVAILABLE COPY

Find the following to two decimal places:

15. 13% of 9.

16. 57% of 618.

17. 91% of $8.60.

18. 61.4% of $12.87.

19. 17.9% of 650.

20. 2½ % of 375.

21. 1% of 100.

22. 37½% of 56.

23. 40% of 5.

24. 9 ¾ % of 672.

25. 1% of 298.

26. 10% of 298.

27. 100% of 298.

28. 1000% of 298.

Find the following to three decimal places.

29. 128% of 9.

30. 183.6% of 42.

31. 117½% of .06.

32. 246.5% of $18.75.

33. 101.1% of $102.00

34. 532.7% of 945.

35. ½% of 500.

36. .08% of $70.00.

37. .29% of $4.60.

38. ¾ % of $105.23.

39. .1% of 453.

40. .3% of $2,000.

Change the following percents to fractions:

41. $16\frac{2}{3}$%
42. $83\frac{1}{3}$%
43. $62\frac{1}{2}$%
44. 80%
45. 70%

46. 25%
47. .25%
48. 150%
49. 375%
50. 500%

Change the following decimals to percents:

51. .49
52. .93
53. .07

54. .465
55. .0025
56. 2.35

57. $.33\frac{1}{3}$
58. 1.001
59. 4.00

Change the following fractions to percents:

60. $\frac{3}{4}$
61 $\frac{1}{8}$

62. $\frac{7}{8}$
63. $\frac{9}{10}$

64. $\frac{33}{100}$
65. $2\frac{1}{4}$

Find the following percents. Carry all divisions to four decimal places and round your final result to one decimal place.

66. 9 is what percent of 45?____________
67. .04 is__________% of .1?
68. __________ % of 76 is 38?
69. What percent of 2 is 1.6? ____________
70. $.70 is __________% of $32.00?
71. 283 is ________% of 100?
72. $8.70 is __________% of $108.75?
73. What percent of $242.16 is $.06? ________________
74. $3.98 is __________% of $39.80?
75. $.71 is ___________% of $675?

Perform the following operations as indicated:

Add:

76.
392
405
599
32
7
60

77.
6007.3
1215.35
1000.05
892.1

78. $345 + $678 + $921 + $876.23 = ______

79. $28.16 + $4.20 + $36.36 + $5.05 = ______

Subtract:

80.
857
92

81.
8275
2987

82.
$68.56
13.29

83. 7,129,362 - 5,297,238 = ______

84. 14.32 - 12.666 = ______

85. Subtract 802 from 921. ______

86. From 9.635 subtract 7.298. ______

Multiply:

87.
372
x 45

88.
46.25
x 2.05

89. 269 x 296 = ________

90. $72.29 x 104 = ________

Divide: Round off answers to the third decimal place

91. $47\overline{)362}$

92. $8.2\overline{)95.68}$

93. 162 ÷ 98 =

94. .0215 ÷ 32.2 =

95. $\frac{129}{35}$

96. $\frac{3.625}{.4045}$

77-a

OPTIONAL: See if you can find the pattern and supply the missing numbers.

Add Pattern

Subt. .2 1. .8, ___, ___,___,___,___,___,___

2. .28,.33,.38,___,___,___,___,___,___

3. 1.00,1.12,1.24,___,___,___,___,___

4. 13.7,12.6,11.5,___,___,___,___,___

Add .03 5. 6.3,___,___,___,___,___

6. 8.9,11.1,13.3,___,___,___,___,___

7. 68.57,68.63,68.69,___,___,___,___

8. 3.4,3.3,3.2,___,___,___,___,___

9. 16.1,19.4,22.7,___,___,___,___

Add .17 10. 7.6,7.77,___,___,___,___,___

11. .8,___,2.6,___,___,___,___

Subt. .02 12. 5.1,___,___,___,___,___

13. .16,.32,.48,___,___,___

14. 43.7,43.0,42.3,___,___,___,___

15. .21,___,.84,___,___,___,___

16. 92.8,92.5,92.2,___,___,___,___,___

ED 069469

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

BASIC MATHEMATICS
machine calculator course

a text-workbook
BOOK 2

1969
revised

Windsor Public Schools

TABLE OF CONTENTS

Chapter V - Combined Operations

		Page
5-1	Summary of the Course	78
5-2	Adding and Subtracting in the Same Problem	78
5-3A	Cancelling A Wrong Entry	79
5-3B	Flowcharting Addition and Subtraction	79a
5-4	Deposits and Withdrawals in the Same Problem	80
5-5	Addition and Subtraction in Balancing a Checking Account	81
5-5C	Addition and Subtraction Using the Sub-Total Key	83
5-6	Addition and Division in Finding Averages	85
5-7	Addition and Division in Finding Per Cent of Total	86
5-8	Multiplication and Addition	88
5-9	Multiplication Followed by Addition	89
5-9A	Multiplication Followed by Addition Using the Automatic Sub-Total Key	91
5-10	Multiplication and Subtraction (Discount)	92
5-11	Multiplication and Subtraction (Bank Discount)	94
5-12	Subtraction and Division (Per Cent of Increase)	95
5-13	Subtraction and Division (Per Cent of Decrease)	96
5-14	Multi-Factor Multiplication	97
5-15	Automatic Squaring	99
5-16	To Cube A Number	100
5-17	Capacity of the Machine Calculator	101
5-18	Multiplication of Three or More Factors Followed by Division	102
5-19	Multiplication of Two Factors Followed by Division	103
5-20	Division Followed by Multiplication	104
5-21	Successive Divisions	106
5-22	Division Followed by Addition	107
5-23	Review	108

Chapter VI - Buying and Selling

Page

6-1 Introduction to Chapter 111

6-2 Shopping 111

6-3 Finding the "Better Buy" 114

6-4 Store Employees 117

6-5 Sales Tax 117

6-6 Discount 120

6-7 Buying in Quantity 123

6-8 Counting Change 130

6-9 Cash Register Slips 134

6-10 Averages 138

6-11 Cost, Mark Up, Selling Price 146

6-12 Mark Up, Profit, and Overhead 150

6-13 Finding the Selling Price 153

6-14 Per Cent Mark Up 154

6-15 Per Cent Increase or Decrease 156

6-16 Commission 158

6-17 Review Exercises 162

Chapter V

COMBINED OPERATIONS

CHAPTER V
Combined Operations

5-1 Summary of the Course

So far, you have reviewed your basic arithmetic using a machine calculator. You have used whole numbers, decimal numbers, fractions, and per cents. The four basic operations that you have used have been addition, subtraction, multiplication, and division. Now you are ready to combine these operations.

Later in the course you will be doing word problems that require combined operations. You are now going to practice combined operations to prepare for these word problems.

5-2 Adding and Subtracting in the Same Problem

Have you ever entered the wrong number in the machine when you are adding a column of numbers? You can correct your mistake without having to repeat the whole problem.

Example:

$ 67.55	Suppose you have printed 6755 correctly, but you enter
43.<u>98</u>	43<u>89</u> instead of 43<u>98</u>. You changed the order of the 8
21.49	Instead of starting from the beginning, you can subtra
<u>20.01</u>	the wrong entry 4389 to cancel out your mistake. Then
	add the correct entry 4398.

Your tape will read like this:

```
 67|55  +
 43|89  +
 43|89  -
 43|98  +
 21|49  +
 20|01  +
153.03  T
```

Try this problem.	Suppose you did this.	To correct your mistake.
467 +	467 +	467 +
312 +	321 + ← ERROR	321 + CORRECTION
687 +	687 +	321 −
423 +	423 +	312 +
1889 T	1898 T	687 +
	ERROR	423 +
T	T	1889 T

5-3A Cancelling A Wrong Entry

EXERCISES: Enter the numbers given to find the correct total. Then do the problem by entering the wrong number and correcting the error. Check totals.

1\.
$34.25
6.20
62.56 wrong entry $62.65
40.03
1.97

2\.
$347.01
30.37
198.25 wrong entry $198.52
19.64
1.18

3\.
$18.98
3.05
50.60
39.58 wrong entry $39.52
28.32
98.30

4\.
$31.09
76.40
341.98
93.45 wrong entry $93.54
201.00

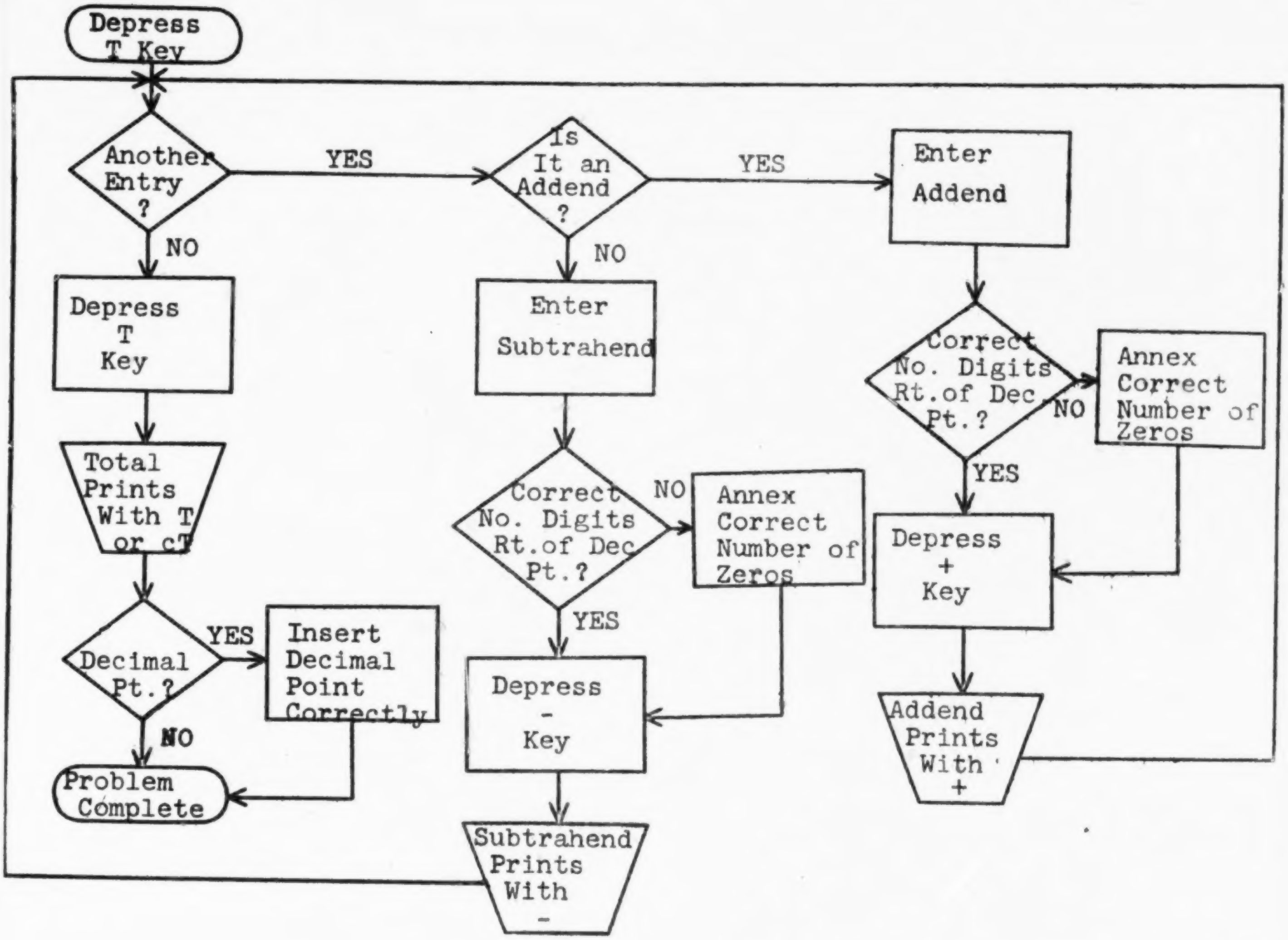
5\.
$405.81
45.19
2250.89
43.01 wrong entry $43.10
10.03
63.98

6\.
3.001
.0097 wrong entry .097
40.3
500.5
.08
3.007

7\.
8702
7802
2708
2708 wrong entry add 2708 3 times
5496
5946

8\.
9450
1395
4072
7950
7950
7590 wrong entry 7950

9\.
6.233
24.9 wrong entry .249
4.978
85.36
9.334


Depress T Key
Another Entry ?
YES
NO
Depress T Key
Total Prints With T or cT
Decimal Pt.?
YES
NO
Insert Decimal Point Correctly
Problem Complete
Is It an Addend ?
YES
NO
Enter Subtrahend
Correct No. Digits Rt. of Dec Pt.?
NO
YES
Annex Correct Number of Zeros
Depress - Key
Subtrahend Prints With -
Enter Addend
Correct No. Digits Rt. of Dec Pt.?
NO
YES
Annex Correct Number of Zeros
Depress + Key
Addend Prints With +

5-3 B EXERCISES:

1. Could this flowchart be used to solve an addition problem? How?

2. Could this flowchart be used to solve a subtraction problem? How?

3. Make a flowchart for addition and subtraction of whole numbers only.

79-a

Additional Practice Problems:

1)
584.23
-11.61
5006.76
319.95
-3.50
-816.00
-59.86

2)
39.75
9.68
-58.26
5.61
87.63
-11.21
9.46

3)
105.98
21.333
-4.09
98.99
19.95
-8.33
516.0046

4)
.4976
.241
-.5
.666
-.125
.20

5)
6.931
- .0621
-3.68
.0004
-9.014
13.1

6)
58.74
-2.9
.965
-77.7
39.250
- .595

7)
57.5
-6.4
97.21
-7.6
15.02
9.27

8)
.0057
.0216
-.05
-.0034
.123
-.0005

9)
6.35
-.386

10)
-.8415
6.214

11)
98.673
-8.9673

12)
12568
-9837.7

13)
12.3
-5.94
-2.3
125
-76
4.93

14)
-9.84
.7
-.21
-17.3
4.02
99.99

15)
123.6
-19.26
-7.41
-8.9
7.321
-18.4

16)
127.4
-17.3
-98.12
5.3
4
-17

17)
1.9
-1.09
-13.2
-6.734
.987
+5.67
14.26

18)
5.6
-4
6.56
.09
-2.1

19)
.056
-.009
+.1
-.006

20)
206.65
-127.4
-56
.14
-9.8

5-4 Deposits and Withdrawals in the Same Problem

The teller at a bank must add and subtract in the same problem. When you deposit money in the bank, he adds it to your account. When you write a check, the amount of the check is subtracted from your account.

Example:

$116.80	+ balance in your account	(Add Key)
78.32	+ deposit	(Add Key)
24.68	- withdrawal	(Subtraction Key)
16.05	- withdrawal	(Subtraction Key)
45.00	- withdrawal	(Subtraction Key)
28.14	+ deposit	(Add key)
$137.53	+ new balance	(Total)

5-4 EXERCISES: Find the totals. Be sure that you press the add key to put in numbers without a sign before them. Use the red subtraction key when the number has a minus sign before it. Be alert.

1.	2.	3.	4.	5.
60	655	8700	$21.43	$472.00
-50	432	3200	- 9.70	397.00
90	-791	-4800	-18.75	.95
-40	-106	9400	30.05	-51.84

6.	7.	8.	9.	10.
432,000	321.10	8702	349,000	21.75
-670,000	-97.05	2708	437,000	-30.28
1,200,000	182.90	-7802	241,000	25.98
940,000	49.07	-5496	-28,000	29.98
		1964	197,000	-36.51
			-542,000	14.34

5-5 Addition and Subtraction in Balancing a Checking Account

Find the balance in this checking account: add the balance at the beginning, add deposits, and subtract checks in the order given.

Balance at the beginning $75.44

Date	Deposits	Checks
Oct. 5	$120.00	
Oct. 7		$ 5.00
Oct. 9		12 .43
Oct. 10		2.47
Oct. 11	$ 65.20	
Oct. 13		67.50
Oct. 15		9.92
Oct. 16		15.07
Oct. 17	$ 50.00	
Oct. 20		24.00
Oct. 24		15.00
Oct. 28		1.47

____

New Balance

The numbers added, $75.44 (balance at the beginning,) deposits $120, $65.20 and $50 should have a + sign after each of then on the tape. The amounts of the checks should have a minus (-) sign after each of them. Check your tape. Put the decimal point in each number on your tape. Be sure that your decimal points are in a straight line. Add zeros in the cents column when there are no cents given. Write your final balance in the space provided in this workbook.

To check this problem:

a) Add the balance at the beginning, and the three deposits $120.00, $65.20, and $50.00.

b) Then add together the amounts of the checks.

c) Subtract the total of the checks from the total of the deposits with the balance at the beginning.

Your answer should be the same as the New Balance that you found on Oct. 28. The balance should be $157.78 for both methods.

5-5 EXERCISES B: Find the balance in this checking account.

Date	Deposits	Withdrawals (Checks)	
Nov. 1	Balance at the beginning		$34.25
Nov. 3		$ 5.00	
Nov. 5		12.49	
Nov. 6		8.03	
Nov. 8	$145.27		
Nov. 10		72.00	
Nov. 14		43.43	
Nov. 15	75.75		
Nov. 16		3.40	
Nov. 18		25.50	
Nov. 20		5.55	
		Final Balance	$

Put numbers into the machine in the order given according to the dates. Enter the balance at the beginning and the deposits into the machine using the add key. Enter checks into the machine using the subtraction key. Show the total in the space provided for the final balance. Put the decimal point in each number on your tape.

Check this problem by adding together the balance at the beginning and the deposits. Then add together all of the checks. Subtract the total amount of the checks from the total deposits and the balance at the beginning. Does your final balance check?

5-5 C Addition and Subtraction Using the Sub-Total Key

You may want to know the amount of money in your account after each deposit and after each withdrawal. This is called the <u>sub-total</u>. The machine will print the sub-total after each entry, if you press the sub-total key (ST); yet, it will keep the sum in the machine and continue to add or subtract the amounts that you enter until you press the total key.

Example:

			Sub-totals
Balance at beginning			$ 92.38
Deposit	$65.00		157.38
Check		$38.15	119.23
Check		$ 6.38	112.85
Deposit	$30.00		142.85
		Final Balance	142.85

```
 9238  +
 6500  +
15738  S

 3815  -
11923  S

  638  -
11285  S

 3000  +
14285  S

14285  T
```

Solution:

a) Set 9238, press add key; set 6500, press add key, press sub-total key --- answer on tape is 15738 S

b) Set 3815, press the subtraction key; press sub-total key, answer is 11923 S

c) Set 638, press the subtraction key; press sub-total key; sub-total is 11285 S

d) Set 3000, press add key, press sub-total key; answer is 14285 S

e) Press the total key after the final entry in the problem. This shows you the total and clears the machine.

5-5 C EXERCISES: Find the sub-totals after each entry:

CHECKS	DEPOSITS	BALANCE (Sub-Totals)
		$ 140.39
$ 32.47		
12.11		
23.08		
	$175.46	
102.41		
24.32		
	$3.62	
62.50		
5.75		
131.08		
	Final Balance	

5-6 Addition and Division in Finding Averages

When we find averages, we combine addition and division.

Example: If your grades last week were 82, 73, 95, 60, and 100, what was your average? To find the average you would add together your daily grades and divide the total by the number of grades.

82 + 73 + 95 + 60 + 100 = 410;   410 ÷ 5 = 82

Your average for the week was 82.

```
 82  +
 73  +
 95  +
 60  +
100  +
410  T

410  +
410  ÷
  5  :
 82  T
     T
```

5-6 EXERCISES: Find the averages of the following: Round off your answers to the nearest whole number.

		Total	Average
1.	63, 75, 73, 68, 70		
2.	68, 66, 72, 65, 73, 73, 71, 73		
3.	152, 166, 140, 147, 130, 145, 150, 159		
4.	21, 32, 25, 21, 27, 38, 14, 17		
5.	6, 4, 5, 7, 8, 9, 8, 7, 3, 5, 7, 6, 5, 8		
6.	$212, $315, $146, $208, $104		
7.	3, 7, 5, 8, 10, 15, 9, 7, 16, 4, 6, 13		
8.	111, 115, 116, 108, 144, 185, 98, 105		
*9.	28¢, 27¢, 33¢, 43¢, 47¢, 51¢, 17¢, 28¢		
**10.	59.5, 60.0, 60.5, 61.0, 59.5, 60.6, 59.8		
**11.	33.5, 31.5, 37.0, 38.0, 35.5, 36.0		
**12.	5.0, 5.1, 5.0, 5.2, 5.1, 4.9, 5.0, 5.3		
***13.	4.20%, 4.30%, 4.25%, 4.32%, 4.41%, 4.26%		
**14.	439.9, 439.9, 440.0, 440.3, 440.1, 440.2		
15.	1.2836, 1.2798, 1.2853, 1.2819, 1.2805 Find average to 4 decimal places.		

* Find average to nearest cent.
** Find average to nearest tenth.
*** Find average to nearest hundredth per cent

5-7 Addition and Division in Finding Per Cent of Total

In Korvettes, the owners are often interested to know the amount of sales in each of the various departments, and what per cent each department contributes toward the total sales.

Example:

Department	Sales	Per cent of total
A	$9300	29.74%
B	$4562	14.59%
C	$6395	20.45%
D	$8926	28.55%
E	$2086	6.67%
	$31,269	100.00%

```
     9300      +
     4562      +
     6395      +
     8926      +
     2086      +
    31269      T

9300.00000     +
9300 00000     :
     31269     :
     29741     T  ← 29.74%
     29671     T
```

a) Add the sales to find the total sales.

b) Divide the sales for each department separately by the total sales to find the per cent of the total.

For example in department A, divide 9300 by the total, 31,269. Find the per cent to five decimal places by adding 5 zeros to the divisor 9300. Then round off to the nearest hundredth per cent (four decimal places).

Since all of these per cents added together should equal 100% we can obtain greater accuracy if we carry out the per cents to hundredths of a per cent.

5-7 EXERCISES:

1.

DEPARTMENT	SALES	% OF TOTAL
A	$4715	
B	$3605	
C	$8870	
D	$1894	
E	$2662	
F	$4896	
		100.00%

2.

DEPARTMENT	SALES	% OF TOTAL
G	$ 9200	
H	$ 8675	
I	$11234	
J	$ 6050	
		100.00%

3.

DEPARTMENT	SALES	% OF TOTAL
K	$8500	
L	$4360	
M	$6295	
N	$2095	
		100.00%

4.

DEPARTMENT	SALES	% OF TOTAL
P	$51,250	
Q	$11,480	
R	$ 9,655	
S	$ 3,085	
T	$ 4,885	
		100.00%

5-8 Multiplication and Addition

In Connecticut a sales tax of 3½% is added to the price of many items that you buy. For example, if you buy a pair of slacks costing $4.50, you are charged 3½% sales tax if you are 16 years of age or older.

a) To find the amount of tax, since 3½% = .035, you multiply .035 times $4.50.

b) Round off the tax to the nearest cent ($.16)

c) Then add the tax to the cost to find the total amount which you must pay ($4.66).

```
     4 5 0  x <
     .0 3 5    =
 1 5 ↓7 5 0    T

               T

     4 5 0     +
       1 6     +
     4.6 6     T
```

5-8 EXERCISES:

Cost of Item	3½% Sales Tax	Total Cost
1. $100.00		
2. $ 25.00		
3. $ 35.15		
4. $ 64.50		
5. $ 1.43		
6. $ 5.16		
7. $179.50		
8. $ 17.95		
9. $ 49.98		
10. $ 35.60		
11. $299.95		
12. $ 29.99		
13. $ 4.49		
14. $ 5.57		
15. $ 19.88		

5-9 Multiplication Followed by Addition

Example:

24 bath towels at \$2.39 each = \$57.36
15 face cloths at \$ .69 each = \$10.35
20 hand towels at \$1.19 each = \$23.80

To find the total cost of the above items:

a) Multiply 24 times \$2.39 to find the product \$57.36.
b) 15 x \$ .69 to get \$10.35.
c) 20 x \$1.19 to get \$23.80

Each of these products is called an extension.

d) Add the three extensions to find the amount of the total bill \$91.51.

5-9 EXERCISES: Multiply to find the extensions and add the extensions to find the totals. UNIT PRICE means the price of one item (or unit).

	QUANTITY	UNIT PRICE	EXTENSION
1.	35	\$2.25	\$______
	48	\$3.15	\$______
	57	\$4.45	\$______
		Total	\$______

	QUANTITY	UNIT PRICE	EXTENSION
2.	112	\$ .75	\$______
	62	\$1.75	\$______
	83	\$3.05	\$______
		Total	\$______

	QUANTITY	UNIT PRICE	EXTENSION
3.	175	$12.50	$______
	43	$ 8.25	$______
	275	$ 9.85	$______
	48	$13.05	$______
	360	$16.65	$______
		Total	$______

	HOURS	HOURLY PAY	EXTENSION
4.	40	$2.75	$______
	10	$3.50	$______
	6	$2.60	$______
		Total	$______

	HOURS	HOURLY PAY	EXTENSION
5.	150	$11.25	$______
	38	$ 7.75	$______
	215	$ 8.60	$______
	53	$15.50	$______
	325	$ 9.10	$______
		Total	$______

	NO. LBS.	COST PER LB.	EXTENSION
6.	83	$3.75	$______
	36	$7.70	$______
	65	$8.85	$______
		Total	$______

(OPTIONAL)

5-9 B Multiplication Followed by Addition Using the Automatic Sub-Total Key

You can find the total of the products of a series of multiplications in the problems in 5-9 without finding the individual extensions. Shift the automatic sub-total lever down at the lower right corner of the machine.

Example:

24 bath towels at $2.39 each
15 face cloths at $ .69 each
20 hand towels at $1.19 each

Solution:

a) Set 24 and press the times key: set 239 and press the multiplication equals key: the product 5736 is printed as a subtotal.

b) Set 15, press times key; then 69 and multiplication equals key: the number printed on your tape is 6771, the accumulation of the first two products.

c) Then set 20, press times key, then 119 and the multiplication equals key; the number printed 9151 is the accumulation of the 3 products, which is the total in this problem.

5-9 B EXERCISES: Use the automatic sub-total key: find accumulative totals:

1. Hours	Hourly Pay		2. No. Lbs.	Cost per lb.	
40	$3.60		78	$ .31	
9	5.40		64	$ .39	
8	7.20	______	136	$ .23	______
	Total	______		Total	______

5-10 Multiplication and Subtraction (Discount)

When you do discount problems, you combine the operations multiplication and subtraction.

a) To find the discount, you multiply the rate of discount times the list price.

b) To find the net proceeds, you subtract the discount from the list price.

Example: What are the net proceeds on an item that has a list price of $98.75 and a rate of discount of 5%?

List price	$98.75
Discount (5% of $98.75) =	<u>$ 4.94</u>
Net Proceeds	$93.81

```
  9875  x <
   .05    =
4.9375    T
          T
  9875    +
   494    -
  9381    T
```

Enter 9875 into the keyboard and press the times key. Put 5 into the machine and press the multiplication key.

Be sure to place your decimal points correctly. 5% is written .05; since <u>your machine doesn't print a zero before a non-digit number</u>, you must write the zero on your tape with a pencil and locate the decimal point in front of the zero. With your pencil start from the decimal point in the second factor (.05) and draw a vertical line down to the product. Then move to the <u>left two decimal places</u> in the product (because there are <u>two decimal places</u> in the first factor 98.75) Place the decimal point between the 4 and the 9 in the answer 4.9375. Round off the discount to the nearest cent. (4.94)

To find the net proceeds, subtract the discount of $4.94 from the list price of $98.75. The net proceeds are $93.81.

5-10 EXERCISES: Find the discount and net proceeds. Round off the discount to the nearest cent.

	LIST PRICE	RATE OF DISCOUNT	DISCOUNT	NET PROCEEDS
1.	$ 98.00	10 %		
2.	$ 10.00	8 %		
3.	$ 3.60	12½%		
4.	$ 45.00	20 %		
5.	$ 12.00	18 %		
6.	$ 27.00	25 %		
7.	$ 500.00	15 %		
8.	$ 25.75	22½%		
9.	$ 49.50	5 %		
10.	$ 180.00	6¼%		
11.	$ 36.85	10 %		
12.	$ 115.94	2½%		
13.	$ 83.90	3 %		
14.	$ 245.75	7½%		
15.	$ 32.90	9 %		
16.	$ 250.45	11 %		
17.	$ 340.28	19 %		
18.	$ 88.35	30 %		
19.	$1134.00	6 %		
20.	$6100.00	4½%		

5-11 Multiplication and Subtraction (Bank Discount)

When you borrow money from a bank or a finance company, interest is generally collected in advance. The interest collected in advance is called <u>bank discount</u>. The amount of money received by the borrower is called <u>net proceeds</u>.

Example: If you borrowed $325 from a finance company at the rate of 5¼% per year, how much is the bank discount? What is the net proceeds?

```
   3 2 5 × ×
  .0 5 2 5   =
1 7.0 6 2 5  T

 3 2 5.0 0   +
   1 7.0 6   -
 3 0 7.9 4   T
```

Solution:

a) Change 5¼% to 5.25% to .0525.

b) Multiply .0525 × $325 to find the bank discount.

c) Subtract $17.06 from $325 to find the net proceeds.

5-11 EXERCISES: Complete the following table. Round off the bank discount to the nearest cent.

	PRINCIPAL	RATE OF BANK DISCOUNT	BANK DISCOUNT	NET PROCEEDS
1.	$ 300	5 %	______	______
2.	$ 950	3½%	______	______
3.	$ 1260	4 %	______	______
4.	$ 320	7½%	______	______
5.	$ 1300	5½%	______	______
6.	$ 510	15 %	______	______
7.	$ 740	10 %	______	______
8.	$ 579	6 %	______	______
9.	$ 8500	4½%	______	______
10.	$12,600	12½%	______	______

5-12 Subtraction and Division (Per Cent of Increase)

Finding the amount of increase and per cent of increase.

Example: If Mott's super market sold $1875 worth of produce on Friday and $2310 worth of produce on Saturday, what was the amount of increase? Find the per cent of increase.

$$\begin{array}{rl} \$2310 & \text{Saturday's sales} \\ -\underline{1875} & \text{Friday's sales} \\ \$\ 435 & \text{increase} \end{array} \qquad \frac{435.000}{1875.} = .232 = 23\%$$

To find the amount of increase subtract the smaller number from the larger one. $2310 - $1875 = $435.

Divide the increase by the previous amount $1875. to find the per cent of increase. Add three zeros to the numerator of the fraction, so that you can find the quotient to three decimal places. Then round off the answer to the nearest whole per cent.

5-12 EXERCISES:

	SALES-NOV.	SALES-DEC.	INCREASE	% OF INCREASE
1.	$ 4890	$6565	________	__________
2.	$ 1238	$1328	________	__________
3.	$ 857	$ 902	________	__________
4.	$ 550	$ 796	________	__________
5.	$ 1255	$1499	________	__________
6.	$ 750	$1060	________	__________
7.	$ 3355	$3690	________	__________
8.	$ 8900	$10350	________	__________
9.	$ 7065	$8880	________	__________
10.	$ 10665	$11,490	________	__________
11.	$ 3845	$5625	________	__________
12.	$21,666	$23,440	________	__________

Pg 95

5-13 Subtraction and Division (Per Cent of Decrease)

Find the amount of decrease and per cent of decrease.

Example: If your family spent $35 for groceries last week and $26.95 this week, what was the amount of decrease? Also, what was the per cent of decrease?

$35.00 8.05000 ÷ $35. = .23 = 23% Per cent of decrease
-26.95
$ 8.05 Amount of decrease

To find the amount of decrease, subtract the smaller number from the larger one. $35.00 - $26.95 = $8.05

Divide the decrease by the previous amount $35. to find the per cent of decrease. Round off the answer to the nearest whole per cent.

5-13 EXERCISES:

	EXPENSES - Dec.	EXPENSES - Jan.	DECREASE	% of DECREASE
1.	$ 88.35	$71.25	______	______
2.	$ 42.40	$36.00	______	______
3.	$ 9.00	$ 6.65	______	______
4.	$ 10.22	$ 9.15	______	______
5.	$ 63.00	$52.05	______	______
6.	$ 6.45	$ 5.25	______	______
7.	$ 14.98	$12.20	______	______
8.	$ 1.78	$ 1.40	______	______
9.	$ 46.60	$32.12	______	______
10.	$ 7.85	$ 5.25	______	______
11.	$ 11.49	$ 9.85	______	______
12.	$ 13.28	$11.66	______	______
13.	$ 14.87	$12.15	______	______
14.	$ 88.80	$65.50	______	______
15.	$ 112.05	$78.50	______	______

5-14 Multi-Factor Multiplication

(See flowchart at bottom of page 98.)

How would you multiply 15 x 12 x 8? Did you multiply 15 x 12 to get 180; then multiply 180 x 8 to get the final product 1440? We can simplify this problem by using the "TR" key in the "memory" part of the machine. Enter 15 in the key board, then punch the times key. Enter 12, then punch the "TR" key, and a total will appear on the tape. (TR means Total Retained). The total 180 will be kept in the memory of the machine. Then put in 8 and press the multiplication equals key to get the final product 1440.

```
  15 x <
  12   =
 180 x T

   8   =
1440   T
```

Let's try another problem: 2 x 3 x 5 x 8

a) Punch 2 and the x key.

b) Punch 3 and the "TR" key. This product will print on the tape 6xT.

c) When you punch 5 and the "TR" key again, you are really multiplying 6 x 5, and your product will read 30 x T. This answer is also held in the memory.

d) Now punch 8 and the multiplication equals key; now you are multiplying 30 x 8 and the final product 240 T will appear on your tape.

```
  2 x <
  3   =
  6 x T
  5   =
 30 x T
  8   =
240   T
```

Notice that when you press the "TR" key, the product shows on the tape with an "X" before the "T" for Total. The equals key gives you the final total and does not keep the partial product in the memory.

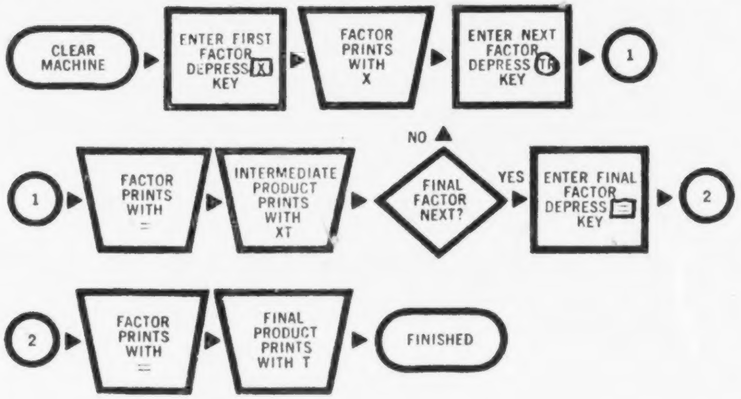
You can multiply together as many factors as you like using the "TR" key between each factor. Use the multiplication equals key only after the last factor to find the final product.

5-14 EXERCISES: Find the products using the "TR" key.

Check the location of the decimal point in each answer.

1. 75 x 29 x 10 = ______
2. 56 x 4 x 32 = ______
3. 45 x 15 x 7 = ______
4. 25 x 35 x 45 = ______
5. 11 x 22 x 33 = ______
6. 63 x 9 x 46 = ______
7. 9 x 12 x 24 = ______
8. 37 x 35 x 75 = ______
9. 19 x 315 x 765 = ______
10. 376 x 23 x 412 = ______
11. .06 x 45 x 2.5 = ______
12. .04 x 850 x 3.75 = ______
13. .035 x 70 x 1.25 = ______
14. 3.1416 x 10 x 10 = ______
15. 3.5 x 4 x 3.75 = ______
16. 8.8 x 3.5 x 4.2 = ______
17. 2.6 x 1.9 x .75 = ______
18. 3.25 x 2.3 x 1.82 = ______
19. 33 x 14 x 9 x 7.5 = ______
20. 48 x 20 x 5.5 x 8.4 = ______

FLOWCHART FOR MULTI-FACTOR MULTIPLICATION


CLEAR MACHINE
ENTER FIRST FACTOR DEPRESS X KEY
FACTOR PRINTS WITH X
ENTER NEXT FACTOR DEPRESS TR KEY
1
1
FACTOR PRINTS WITH =
INTERMEDIATE PRODUCT PRINTS WITH XT
NO
FINAL FACTOR NEXT?
YES
ENTER FINAL FACTOR DEPRESS = KEY
2
2
FACTOR PRINTS WITH =
FINAL PRODUCT PRINTS WITH T
FINISHED

5-15 Automatic Squaring

To square a number, you multiply a number by itself. $(12)^2$ which is read "twelve squared" means 12 x 12. You can square a number on the machine without resetting the factor, by using the repeat lever at the lower left side of the keyboard above the plus bar.

Example: 12^2

a) Press 12 on the keyboard.

b) Shift the repeat lever to the left.

c) Press the times key.

d) Press the multiplication equals key.

Notice that the repeat lever moves to the right (off position) as soon as the total is obtained.

5-15 EXERCISES: Complete the following table.

1. 1^2 = 1 x 1 = 1
2. 2^2 = 2 x 2 = _____
3. 3^2 = 3 x 3 = _____
4. 4^2 = _____ = _____
5. 5^2 = _____ = _____
6. 6^2 = _____ = _____
7. 7^2 = _____ = _____
8. 8^2 = _____ = _____
9. 9^2 = _____ = _____
10. 10^2 = _____ = _____
11. 11^2 = _____ = _____
12. 12^2 = _____ = _____
13. 13^2 = _____ = _____
14. 14^2 = _____ = _____
15. 15^2 = _____ = _____
16. 16^2 = _____ = _____
17. 17^2 = _____ = _____
18. 18^2 = _____ = _____
19. 19^2 = _____ = _____
20. 20^2 = _____ = _____
21. 21^2 = _____ = _____
22. 22^2 = _____ = _____
23. 23^2 = _____ = _____
24. 24^2 = _____ = _____
25. 25^2 = _____ = _____
26. Make a flowchart for automatic squaring.

5-16 To Cube A Number

12^3 (twelve cubed) means 12 x 12 x 12. Since we have three factors, we can use the "TR" key.

Example: 12^3 = 12 x 12 x 12

a) Enter 12, then press the times key.

b) Enter 12 again, press "TR" key.

c) Enter 12 again, press multiplication equals key. The answer is 1728.

5-16 EXERCISES: Complete the following chart:

1. 1^3 = 1 x 1 x 1 = 1
2. 2^3 = 2 x 2 x 2 = ____
3. 3^3 = ________ = ____
4. 4^3 = ________ = ____
5. 5^3 = ________ = ____
6. 6^3 = ________ = ____
7. 7^3 = ________ = ____
8. 8^3 = ________ = ____
9. 9^3 = ________ = ____
10. 10^3 = ________ = ____
11. 11^3 = ________ = ____
12. 12^3 = ________ = ____
13. 13^3 = ________ = ____
14. 14^3 = ________ = ____
15. 15^3 = ________ = ____
16. 16^3 = ________ = ____
17. 17^3 = ________ = ____
18. 18^3 = ________ = ____
19. 19^3 = ________ = ____
20. 20^3 = ________ = ____
21. 1^4 = 1 x 1 x 1 x 1 = 1
22. 2^4 = ____________ = ____
23. 3^4 = ____________ = ____
24. 4^4 = ____________ = ____
25. 5^4 = ____________ = ____
26. 6^4 = ____________ = ____
27. 7^4 = ____________ = ____
28. 8^4 = ____________ = ____
29. 9^4 = ____________ = ____
30. 10^4 = ____________ = ____
31. 2^5 = ____________ = ____
32. 3^5 = ____________ = ____
33. 4^5 = ____________ = ____
34. 5^5 = ____________ = ____
35. 6^5 = ____________ = ____
36. 7^5 = ____________ = ____
37. 8^5 = ____________ = ____
38. 9^5 = ____________ = ____
39. 10^5 = ____________ = ____
40. 2^6 = ____________ = ____

5-17 Capacity of the Machine Calculator

You have been getting some very large numbers in your answers. In Chapter I, p. 13 prob. 32, you learned that you can enter 12 digit numbers in the machine, and you can print a 13 digit number when you add. When you multiply two factors together, the machine will print all of the digits in your answer if the sum of the digits of the factors equals 12 or less. If the first digit of the number entered with the times key is less than 5, the sum of the digits of both factors can equal 13, and you can obtain a 13 digit answer on the machine.

Example 1:

654321 x 456789 = 298,886.635,269 (12 digits)

1234567 x 987654 = 1,219,325,035,818 (13 digits)

Example 2:

Find 2^{39}. This means 2 x 2 x 2 ......(39 twos)

Enter 2^{39} on the keyboard, punch x key, enter 2, punch "TR" key, enter 2 again, punch "TR" key again. Continue setting 2, then "TR" key until you have entered "2" into the machine 39 times. It isn't really necessary to count until you have entered 39 two's. In the column indicator window above the keyboard, you will notice a number one and one red dot when the answer has one digit in it (2 x 2 = 4). When you multiply 2 x 2 x 2 x 2 = 16, there is a "2" and two red dots. To multiply 2^7 there will be a "three" and three red dots. 2^{20} = 1,048,576 so you will see a "7" and seven dots (3 solid red, 3 with holes, and one more solid red). At 2^{30} = 1,073,741,824 you will notice that there is a "0" with 10 dots in the window and at 2^{34} there will be a "1" with eleven dots.

When you press the "TR" key after the 38th two, there will be a "2" and 12 dots in the window. When you press the "TR" after the 39th two, the machine will not perform the operation, because the factor held in the machine was 549,755,813,888. Since the first digit of this number is 5, the machine will not print a 13 digit answer. Do not force the "TR" key if it does not go down easily. When the "TR" key does not give an answer, press the total key to clear the machine.

5-17 EXERCISES: Find the value of each of the following:

1. 3^{25} = ______________
2. 4^{20} = ______________
3. 5^{17} = ______________
4. 6^{16} = ______________
5. 7^{14} = ______________
6. 8^{13} = ______________
7. 9^{13} = ______________
8. 10^{11} = ______________
9. 12^{10} = ______________
10. 15^{10} = ______________

5-18 Multiplication of Three or More Factors Followed by Division

Use the "TR" key when you multiply the three or more factors. Then insert the product in the key board. Put the divisor in the machine and press the division equals key.

Example:

$$\frac{12 \times 78 \times 15}{144} = 97 \text{ R } 72$$

Solution:

a) Set 12 on the keyboard, press times key.

b) Set 78, press the "TR" key.

c) Set 15, press multiplication equals key.

d) Set the product 14040 in the machine, press "D" bar.

e) Put in the divisor, 144, and press the division equals key.

The machine will print the answer 97 R 72.

```
   1 2 x <
   7 8   =
 9 3 6 x T

   1 5   =
14 0 4 0  T

          ÷
14 0 4 0  ÷
14 0 4 0  :
  1 4 4   :
    9 7   T
    7 2   T
```

5-18 EXERCISES: Show the answers with remainders. Place decimal points carefully.

1. $\frac{72 \times 85 \times 21}{36}$ = ______

2. $\frac{35 \times 48 \times 12}{192}$ = ______

3. $\frac{56 \times 45 \times 9}{144}$ = ______

4. $\frac{16 \times 30 \times 8}{27}$ = ______

5. $\frac{22.5 \times 41 \times 8.5}{7.5}$ = ______

6. $\frac{6.5 \times 3.75 \times 9.25}{9}$ = ______

7. $\frac{9.97 \times 10.02 \times .7854}{27}$ = ______

8. $\frac{3.1416 \times 10 \times 10}{9}$ = ______

9. $\frac{22 \times 6 \times 6 \times 8}{7}$ = ______

10. $\frac{15 \times 33 \times 48 \times 60}{1728}$ = ______

5-19 Multiplication of Two Factors Followed by Division

Example:

$$\frac{12 \times 78}{15} = 62 \text{ R } 6$$

To keep the product of 12 x 78 in the machine, move the automatic total lever to the right AUT TOT ⇒ OFF

```
 12 * <
 78   =
936   :
 15   !
 62   T
  6   T
```

a) Put 12 into the keyboard and press the times key.

b) Set 78 and press the multiplication equals key.

c) Set the divisor 15 and press the division equals key.

The product 936 is printed automatically as the dividend and the divisor and the quotient are printed on the tape. However, you will have to press the total key to print the remainder and to clear the machine.

5-19 EXERCISES: Find the answer with the remainder as shown in the example.

1. $\frac{12 \times 28}{8}$ = ______

2. $\frac{14 \times 125}{9}$ = ______

3. $\frac{72 \times 85}{144}$ = ______

4. $\frac{35 \times 48}{192}$ = ______

5. $\frac{896 \times 125}{120}$ = ______

6. $\frac{22 \times 35}{7}$ = ______

7. $\frac{4.8 \times 1.4}{21}$ 9. $\frac{325 \times 43}{27}$

8. $\frac{96 \times 45}{32}$ 10. $\frac{1.62 \times 14.4}{1.5}$

5-20 Division Followed by Multiplication

The example in paragraph 5-19 which reads $\frac{12 \times 78}{15}$ can be written $\frac{12}{15} \times 78$. Instead of multiplying 12 x 78, then dividing the answer by 15, you can change $\frac{12}{15}$ to a decimal and multiply .8 x 78. Here the product is 62.4 because you changed $\frac{12}{15}$ to a decimal without a remainder.

When you find interest on $500 at 4% for 9 months, you multiply $500 \times \frac{4}{100} \times \frac{9}{12}$. You can multiply 500 x 4 x 9 to get 18000. Then divide 18000 by 1200 to find the interest $15.00; or you can use the decimal form for 4% which is .04, and divide 9.00 by 12 to get .75. Then multiply 500 x .04 x .75 which equals $15.00.

In these examples the fractions were changed to decimals by adding zeros to the numerator and dividing by the denominator, so that the decimals came out even. $\frac{12}{15} = .8$; $\frac{9}{12} = .75$. When you are changing from fractions to decimals that do not come out even, you will be asked to carry out the decimal to a specific number of places.

Example: AUT TOT OFF

Divide the fraction to 3 decimal places.

$$\frac{2305}{12} \times 45 = \frac{2305.000}{12} \times 45 = 192.083 \times 45 = 8643.735$$

Solution:

```
2 3 0 5 0 0 0  ÷
2 3 0 5|0 0 0  :
        1 2    :
  1 9 2|0 8 3  T
          4    T
        4 5    =
8 6 4 3|7 3 5  T
```

a) Set 2305 000 and press the "D" bar.

b) Set 12 and press division equals key.

c) The quotient 192.083 is automatically stored in the memory.

d) Then set 45 and press multiplication equals key.

e) The product 8643735 is printed. Place the decimal point in the product to read 8643.735. Round off the answer to the nearest whole number (8643).

5-20 EXERCISES: In the following problems, divide the fraction to 3 decimal places. Round off the answers to the nearest hundredth.

1. $\frac{12}{8} \times 28 =$

2. $\frac{72}{144} \times 85 =$

3. $\frac{96}{32} \times 45 =$

4. $\frac{14}{9} \times 125 =$

5. $\frac{325}{27} \times 43 =$

6. $\frac{72}{360} \times 450 =$

7. $\frac{32}{12} \times 9 =$

8. $\frac{75}{105} \times 90 =$

9. $\frac{336}{810} \times 135 =$

10. $\frac{20}{24} \times 9 =$

(Optional)

5-21 Successive Divisions

In finding the interest on \$350 at 5% for 8 months, you can set up the problem this way: $\frac{350}{1} \times \frac{5}{100} \times \frac{8}{12}$. After you find the product of the numerators, you have to divide by 100 and also by 12. To do this on the machine:

a) Set 350, then times key, press 5, then "TR" key, press 8, then the multiplication equals key.

b) Set the product 14000 on the keyboard with the "D" bar.

c) Set 100, press the division equals key.

The quotient 140 is automatically stored in the memory.

d) Now depress the memory "out" key, then press the add bar to put the quotient in the machine as the dividend.

e) Set 12, press the division equals key, and the final result will be printed on the tape (11 with a remainder 8).

5-21 EXERCISES: Use "TR" key for successive multiplications. Use the "OUT" key for successive divisions. Place decimal points accurately in the answers.

1. $\frac{4.8 \times 1.5 \times 6}{3.6 \times 2.4}$
2. $\frac{7.89 \times 1.20 \times 1.68}{42 \times 1.44}$
3. $\frac{1.62 \times 14.4 \times 3.5}{.56 \times 1.5}$
4. $\frac{42 \times 48 \times 50}{28 \times 16}$
5. $\frac{36 \times 35 \times 77}{55 \times 42}$
6. $\frac{27 \times 10 \times 105}{15 \times 6}$
7. $\frac{18 \times 20 \times 3}{6 \times 12}$
8. $\frac{280 \times .125}{4.2 \times 8}$
9. $\frac{45.961 \times 7.5}{1.5 \times 6.25}$
10. $\frac{.42 \times 12.6 \times 90}{4.5 \times 18 \times .02}$
11. $\frac{13.5 \times 3.5 \times .48}{.42 \times 24 \times .05}$
12. $\frac{.36 \times 31.5 \times .24}{2.8 \times 15 \times .02}$

```
  3 5 0 x ÷
      5   =
1 7 5 0 x T

      8   =
1 4 0 0 0 T

1 4 0 0 0 +
1 4 0 0 0 ÷
    1 0 0 ÷
    1 4 0 T
          T

    1 4 0 x +
    1 4 0 ÷
      1 2 ÷
      1 1 T
        8 T
```

(Optional)

5-22 Division Followed by Addition

To find the Fahrenheit temperature when you know the Centigrade temperature, you multiply the centigrade by $\frac{9}{5}$ and add 32 to the answer.

Example:

$$F = \frac{9}{5} \times 38 = 32$$

You can write this: $\frac{9 \times 38}{5} + 32$

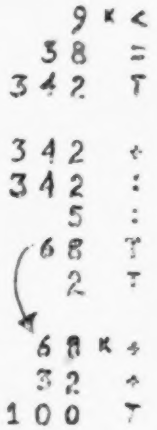
Solution:

a) Multiply 9 x 38 which equals 342.

b) Divide 342 by 5. The quotient is printed on the tape.

c) Now press the memory "out" key, and press the add key. This puts the quotient into the machine to be added.

d) Set 32 into the keyboard, press the add key, then the total key to obtain your result.



```
    9 × <
   38   =
  342   T

  342   ÷
• 342   :
    5   :
•  68   T
    2   T

   68 × +
   32   +
  100   T
```

5-22 EXERCISES:

1. $\frac{9 \times 14}{5} + 32 =$ ________

2. $\frac{9 \times 36}{5} + 32 =$ ________

3. $\frac{9 \times 25}{5} + 32 =$ ________

4. $\frac{9 \times 22}{5} + 32 =$ ________

5. $\frac{9 \times 42}{5} + 32 =$ ________

5-23 Review

1. Find the total:

$$\begin{array}{r} 85.21 \\ -28.30 \\ -52.98 \\ 92.43 \\ -36.15 \\ \underline{4.50} \end{array}$$

2. Find the balance in this checking account:
Balance at the beginning, Nov. 1, $161.42; checks, Nov. 3, $18.75, Nov. 4, $4.82, Nov. 5, $6.15, Nov. 8, $10.80, Deposit, Nov. 15 $54.75, Checks, Nov. 15, $7.20, Nov. 17, $20.50, Nov. 23, $32.58, Nov. 27, $1.50, Deposit, Nov. 30, $75.00.

3. Find the average temperature in Hartford last week if the noon readings were recorded as follows:
Monday 45°, Tuesday 52°, Wednesday 59°, Thursday 43°, Friday 39°, Saturday 38°, Sunday 41°.

4. Find the total enrollment and the per cent enrollment in each class: (Add 3 zeros to the numerators to find the decimal to three places; then round off the per cent to the nearest whole per cent.)

CLASS	ENROLLMENT	DECIMAL	PER CENT
Seniors	278	______	______
Juniors	351	______	______
Sophomores	416	______	______
Freshmen	502	______	______
Total			100%

5. Find the total cost of a color television set priced at $395.50 with 3½% sales tax.

6. Complete the following:

HOURS	HOURLY PAY	EXTENSION
40	$ 3.75	
44	$ 2.92	
37	$ 2.40	
52	$ 1.75	
	Total	

7. If the list price of a watch is $49.50, and the rate of discount is 15%, what is the net price?

8. If you borrowed $350 from a finance company which charged 8% bank discount, what amount of net proceeds would you receive?

9. The minimum pay is $1.40 per hour. If you received $1.75 per hour after you worked six months, what was the increase? What was the per cent of increase?

10. If you sold 83 copies of the Courant on Sunday, December 1 and 75 copies of the Courant on Sunday, December 8, what was the decrease? What was the per cent of decrease?

11. Find the product using the "T̂R" key.

a) 16 x 18 x 9 x 5 = ______ b) 2 x .5 x .9 x 20 x 13 = __

12. Find:

a) $(27)^2$ = ________ d) $(32)^5$ = ______________

b) $(53)^3$ = ________ e) $(46)^6$ = ______________

c) $(71)^4$ = ________ f) $(69)^7$ = ______________

13. Show the answer with the remainder:

$$\frac{12 \times 23 \times 34 \times 45}{56}$$

14. Find the product:

$350 \times \frac{3}{100} \times \frac{8}{12} =$ __________

15. Prepare flowcharts for the operations discussed in:

a. Section 5-6

b. Section 5-8

c. Section 5-9

d. Section 5-9B

e. Section 5-10

f. Section 5-12

g. Section 5-16

h. Section 5-18

i. Section 5-19

j. Section 5-20

k. Section 5-21

l. Section 5-22

Chapter VI

BUYING AND SELLING

CHAPTER VI
Buying and Selling

6-1 Introduction To Chapter

You have now had the practice of combining operations. For the remainder of the course you will be working on many word problems that require you to combine operations.

In this chapter you will recognize many of these word problems. They are problems that people may be involved in whenever they go shopping or when they are working.

6-2 Shopping: The following are kinds of problems encountered while shopping.

6-2 EXERCISES: Put your answers where indicated.

1. You have done some shopping in a grocery store. Find your total bill if you made purchases of \$ .40, \$ .28, \$ .10, \$ .10, \$ .98, \$1.19, \$ .68, \$1.75, \$2, \$2, \$3.50. Ans. \$______

2. How much is your total bill if you spent the following amounts: \$3, \$1.55, \$ .50, \$ .05, \$ .05, \$1.05, \$1.50 \$4, \$2.07, \$1.98, \$ .89, \$1, \$ .40. Ans. \$______

3. A girl spent the following amounts while shopping in a department store. Find the total bill: \$7.49, \$2.50, \$5, \$10, \$12.03, \$ .60, \$20.79, \$8. Ans. \$______

4. Bob bought some items at a hardware store. What amount did he have to spend altogether? \$1, \$3.15, \$ .15, \$5.98, \$ .98, \$ .70, \$ .40, \$ .08, \$ .05, \$ .85, \$2, \$ .28. Ans. \$______

5. In problem 4, Bob paid for his purchases with a $20 bill. How much change did he receive? Ans. $______

6. Mr. Charles is interested in buying a new car. One model is priced at $3185.26 and another model is priced at $2995. How much more does one model cost than the other? Ans. $______

7. John bought a jacket for $12.49. Thomas bought a jacket that was just like John's, but the price of Tom's jacket was $1.93 less than John's. How much does Tom's jacket cost? Ans. $______

8. A dress was selling for $12.49. During a sale, the price was reduced to $9.95. How much money is saved by buying at the sale price? Ans. $______

9. Six gallons of paint are required to paint a home. Each gallon costs $4.99. What is the total cost of paint? Ans. $______

10. What is the total cost of a dozen boards, if each board costs $1.74? Ans. $______

11. The machine that you are using costs $350. There are 23 machines in this room. What is the total cost of all the machines? Ans. $______

12. If you bought four pair of slacks at a cost of $7.95 each, how much would you spend altogether? Ans. $______

13. The price of eight dress shirts is $23.92. How much does each one cost? Ans. $______

14. Twenty rolls of insulation cost $81.50. What is the cost per roll? Give answer to nearest cent. Ans. $____

15. Find the cost of one sport shirt if a dozen costs $53. Give answer to nearest cent. Ans. $____

16. There are 75 apples in a basket. The whole basket of apples costs $2.60. What would one apple cost? Give answer to nearest cent. Ans. $____

---

17. Find the saving on each item.

White Sheets:

a - 72x108 Twin Flat, **reg. 3.29**	**2.79**
b - 39x76 Twin fitted, **reg. 3.29**	**2.99**
c - 81x108 Full flat, **reg. 3.59**	**3.19**
d - 54x76 Full fitted, **reg. 3.59**	**3.39**
e - 90x120 Queen flat, **reg. 4.99**	**4.49**
f - 60x80 Queen fitted, **reg. 4.99**	**4.69**
g - 108x120 King flat, **reg. 7.99**	**7.19**
h - 78x80 King fitted. **reg. 8.49**	**7.99**

Answers:

a d g

b e h

c f

18. What was the regular price of a gallon of this paint?

SAVE 2.12

DUPONT

LUCITE HOUSE PAINT

LUCITE
NEW FORMULA
DUPONT
LATEX
House Paint
OUTSIDE WOOD & MASONRY

Reduced Price:

5.57

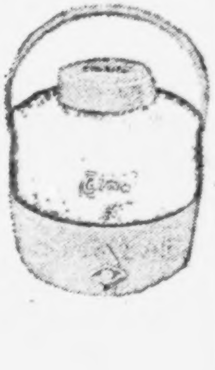
GALLON

19. What would be the total cost of fifteen jugs at the reduced price?

COLEMAN GALLON JUG

$3 88 **REG. $3.97**

- **100% Urethane Insulation**
- **Fast-Flo Faucet**
- **Bail Handle**

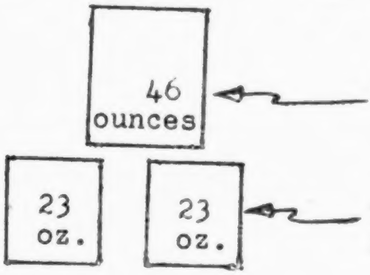


6-3 Finding the "Better Buy"

Many times when shopping you are faced with this kind of problem:

Example 1: One 46 ounce can of pineapple juice costs 39¢.
Two 23 ounce cans of pineapple juice cost 22¢ a can.
How much is saved by buying the 46 ounce can?

Perhaps it would help to draw a picture of the problem, like this: (oz. is an abbreviation for ounce.)



The total cost of this can is 39¢.

The total cost of two cans is 2 x 22¢ = 44¢.

Now compare the total cost of 39¢ and 44¢. The amount saved is 44¢ - 39¢ = 5¢. The better buy is the 46 ounce can of pineapple juice.

Example 2: A 2 ounce jar of instant coffee sells for 53¢.
A 6 ounce jar sells for $1.49. What would 6 ounces cost when bought in the small, 2 ounce, jars?

Solution: Ask yourself this question first: "How many small jars would I have to buy to get 6 ounces?" Do you see that you would have to buy 3 small jars?

If you bought 3 small jars, how much would this cost you?

The total cost is 3 x $.53 = $1.59.

This is the answer to the problem, $1.59.

One more question: How much do you save by buying the large 6 ounce jar?

Solution:

Three small 2 ounce jars cost	$1.59	
One large 6 ounce jar cost	1.49	Subtract
	$ .10	Answer

Answer: You would save $ .10.

6-3 EXERCISES: (Note: 1 pound = 16 ounces)

1. At one store, a 16 oz. can of tomato sauce costs 24¢. At another store, the same tomato sauce costs 17¢ for an 8 oz. can. How much would you save by buying 16 oz. at the first store? Ans. $____

2. At a store, potatoes were on sale at 10 lb. for 59¢. Before the sale, the same potatoes were selling at 5 lb. for 42¢. How much is saved by buying the 10 lb. bag on sale? Ans. $____

3. Flour can be bought in 5 lb. bags for 59¢. A 25 lb. bag costs $2.65. How much do you save by buying the 25 lb. bag? Ans. $____

4. Sears Roebuck sells motor oil in 10 quart containers for $2.30. A single quart of motor oil costs $ .70, at gas stations. How much do you save per quart if you buy the 10 quart container from Sears? Ans. $____

5. A 12 oz. bottle of Vermont Maid Syrup costs 32¢. A 36 oz. bottle sells for 76¢.

   a) How much would 36 oz. cost if bought in the small, 12 oz., bottles? Ans. $____

   b) How much is saved by buying the large, 36 oz., bottle? Ans. $____

6. A 1 lb. can of Crisco shortening sells for \$ .37. A large 2½ lb. can sells for \$ .78.

a) How much does Crisco cost per lb. in the large can?
Ans. \$ _____

b) How much is saved per lb. by buying the large can?
Ans. \$ _____

7. Grape jelly sells at \$ .45 for a 1½ lb. jar. A small 8 oz. jar costs \$ .20.

a) How much would it cost to buy 1½ lb. in the small 8 oz. jars?
Ans. \$ _____

b) How much is saved by buying the large 1½ lb. jar?
Ans. \$ _____

8. A 3 lb. box of Tide soap powder costs \$ .79. A small 12 oz. box costs \$ .32. How much is saved by buying the large 3 lb. box instead of buying 3 lb. of soap powder in the smaller boxes?
Ans. \$ _____

9. A 3 lb. box of Bold soap powder sells for 69¢. A 1½ lb. box sells for 42¢. How much would you save by buying the large 3 lb. box?
Ans. \$ _____

10. A 10 lb. bag of sugar costs \$1.20. A small 8 oz. box of sugar cubes costs \$ .13. If you wanted 10 lb. of sugar cubes, how much more would it cost you than the 10 lb. bag?
Ans. \$ _____

6-4 Store Employees

Store employees are continually faced with problems in mathematics. Cashiers deal with sales tax, counting change, and, for instance, finding the "cost of one can if five cans cost 37¢." Department store clerks become involved in discounts, and average sales per week. Department store buyers must be familiar with cost, mark-up, profit, overhead, and selling price of merchandise.

Let us begin by discussing sales tax.

6-5 Sales Tax

The state of Connecticut has many methods of raising money to pay for the costs of providing services to its people. One of these methods is the state sales tax. Whenever you buy a taxable item in a store, you will pay a little bit *more* than the actual cost of the item. This is because the cashier *adds on* the sales tax to the cost of the item. The store must then send this tax money to the Connecticut State Tax Department.

Would you believe that in 1965 the state of Connecticut collected about $357,000,000 in state sales tax? Where did the money come from? It came from adding up all the pennies, nickles, and dimes that *you* contributed whenever you bought a taxable item in a store.

If you were a cashier in a store, it would be your job to figure out the sales tax for each purchase. You must then make sure that you *add this tax to the customer's bill*! The sales tax in Connecticut is 3½% at present.

Be sure that in all problems involving sales tax you make sure that you ADD THE TAX to the bill. In the following problems, use a sales tax of 3½%.

Example 1: You have made a purchase of $5.

a) How much is the sales tax?

Solution: The tax will be 3½% of $5.

3½% x $5 or

3.5% x $5 or

.035 x $5 = $ .175 = $ .18, rounded off to nearest cent

Answer: The sales tax is $ .18

b) How much will you pay for the purchase?

Solution: You will pay $5 plus the sales tax, or

$5 + $ .18 = $5.18, Answer

Example 2: Find the sales tax and the final amount that you would pay for an automobile that costs $3200.

Solution: a) The sales tax will be 3½% of $3200 or

3.5% x $3200 or

.035 x $3200 = $112

b) Final amount that you will pay is:

$3200 + 112$ = $3312 (Always add the tax on.)

Purchases on which no tax is paid:

No sales tax is charged on purchases of clothing for children under 16 years of age.

No sales tax is charged on purchases that are mailed from Connecticut to other states.

No sales tax is paid on equipment for schools.

6-5 EXERCISES: In each of the following problems, find (a) the sales tax and (b) the final amount of the purchase. Use a sales tax of 3½% for all problems.

1.	Cost of Purchase	Tax	Total
a)	$ .50	$	$
b)	$ 3.50	$	$
c)	$15.72	$	$
d)	$48.09	$	$
e)	$76.33	$	$

2. Four bath towels at a cost of $1.98 each. Tax ______ Total ____

3. Cocktail table at $44.88. Tax ______ Total ____

4. Three piece bedroom suite for $199. Tax ______ Total ____

5. Two shower curtains at $1.88 each. Tax ______ Total ____

6. Twin bunk bed for $79.88. Tax ______ Total ____

7. Twenty boards at $1.49 each. Tax ______ Total ____

8. A 24' by 48" circular swimming pool at $399. Tax ______ Total ____

9. Seven aluminum storm windows at $10.49 each. Tax ______ Total ____

10. New automobile at $2135.48. Tax ______ Total ____

11. Purchases of clothing of $22.21 for a 14 year old boy. Tax ______ Total ____

12. A $10.95 pair of shoes for a 9 year old girl. Tax ______ Total ____

13. A purchase of $30.24 sent to a person living in Vermont. Tax ______ Total ____

14. A purchase of $ .12. Tax ____ Total _____

15. A purchase of $5,000 for a school. Tax ____ Total _____

6-6 Discount

Many of you have waited to buy an article in a store until it could be bought at a discount. The reason, of course, is that you pay less when a discount is given.

In the newspaper you see many discounts stated as:

15% Discount

10% Off

Reduced 20%

½ Off

Save $33\frac{1}{3}$%

All of these mean that------ you save money during a sale!

Example 1: A $16.49 dress is on sale at a discount of 30%.

a) What is the amount of discount?

A discount of 30% means that you will get 30% off the regular price.

30% of $16.49 is

.30 x $16.49 = $4.947 = $4.95, the amount of discount

b) What is the sale price of the dress?

Since you are getting $4.95 off, you will pay

$16.49 - $4.95 = $11.54 for the dress.

Notice that you subtract the discount from the sale price.

Example 2: The regular price of a radio is $18.79. During a sale the radio can be bought at a discount of 25%. Find how much you will pay if the sales tax is 3½%.

a) Amount of discount is:

25% of $18.79

.25 x $18.79 = $4.6975 = $4.70

b) The sale price is:

$18.79 - $4.70 = $14.09

c) How much will you pay if the sales tax is 3½%?

Sales tax must be added to the sale price.

3½% of $14.09 (Not 3½% of $18.79)

.035 x $14.09 = $ .49315 = $ .49, the tax.

You will pay $14.09 + $ .49 = $14.58 for the radio.

IMPORTANT: You must be careful to:

Subtract discounts and

Add sales tax.

6-6 EXERCISES: In the following problem use the given per cent discounts to find the sale price.

1. Complete the table:

	Regular Price	% Discount	Amount of Discount	Sale Price
a)	$12.15	20%	$	$
b)	$ 5.49	25%		
c)	$27.55	15%		
d)	$17.97	$\frac{1}{3}$ off		
e)	$33.47	½ off		

In the following problems use a sales tax of 3½%.

2. The regular price of a radio is $20.79. During a sale the radio can be bought at a discount of 40%. What is the cost of the radio if the sales tax is 3½%?

Discount $____ Discount Price $____ Tax $____ Cost $____

3. The regular price of a carpet is $180. The discount during a sale is "$\frac{1}{3}$ off." Find the cost of the carpet when the sales tax is 3½%.

Discount $____ Discount Price $____ Tax $____ Cost $____

4. The regular price of a Black & Decker lawnmower is $89.95. The lawnmower can be bought on sale at half price. How much would you pay for it is sales tax is 3½%?

Discount $____ Discount Price $____ Tax $____ Cost $____

5. A Zenith portable TV set regularly sells for $139.95. During a 15% sale how much would it cost you if sales tax is 3½%?

Discount $____ Discount Price $____ Tax $____ Cost $____

6. The regular price of a G E alarm clock is $3.19. During a sale it is reduced 55%. What is the selling price, if the sales tax is 3½%?

Discount $____ Discount Price $____ Tax $____ Cost $____

7. Star Hardware has reduced 30-gallon-water-heaters by 18%. If water heaters regularly sell for $54.97 and the sales tax is 3½%, find how much one water heater would cost you.

Discount $____ Discount Price $____ Tax $____ Cost $____

8. E. J. Korvette is offering 42% discount on short sleeve shirts. The regular price is $3.49 per shirt. If the sales tax is 3½% and you bought four shirts, how much would your bill be?

Total Discount $____ Discount Price $____ Tax $____ Cost $_____

9. During a 50% sale a man bought two pair of summer slacks that regularly sold for $8.95 ea. Find his bill if sales tax is 3½%.

Total Discount $____ Discount Price $____ Tax $____ Cost $_____

10. Five gallons of paint, regularly priced at $7.99 per gallon, were bought at a 29% discount. Find the cost of the paint if the sales tax is 3½%.

Total Discount $____ Discount Price $____ Tax $____ Cost $_____

6-7 Buying in Quantity

A cashier at a supermarket or department store must solve the following kinds of math problems:

Example 1: If two cans of soup cost $ .43, how much does one can cost?

Solution: One can must cost half as much as two cans. But ½ of $ .43 is $ .215, or 21½¢. What will the cashier charge for one can then?

He can not charge $ .21, because two cans would then cost 2 x $ .21 or $ .42 and the bargain price is two for $ .43.

What he must do is to charge $ .22 for one can by rounding off $ .215 to $ .22.

Simplified Solution: Since the bargain price is "two for $ .43", the cashier knows that he must divide by two to find the cost of one can.

Now, $ .43 is an odd number, since it ends with the odd number 3. The cashier knows that he will get a remainder when he divides an odd number by 2.

So, he raises the price from $ .43 to $ .44 and then divides $ .44 by 2 to get $ .22 for the price of one can of soup.

Let us try another problem:

Example 2: What is the cost of one can of Crisco shortening, if the bargain price is 3 for $1.00?

Solution. Let us raise the price of $1.00 until we find the next highest number that can be divided by 3 and leave no remainder.

Raise the price to $1.01.

$$\begin{array}{r} .33 \\ 3\overline{)1.01} \\ 9 \\ \hline 11 \\ 9 \\ \hline 2 \end{array}$$

= $ .33 and $\frac{2}{3}$ remainder

Raise the price to $1.02

$$\begin{array}{r} .34 \\ 3\overline{)1.02} \\ 9 \\ \hline 12 \\ 12 \\ \hline 0 \end{array}$$

= $ .34 and 0 remainder

Therefore, the price of one can is $ .34.

Example 3: What is the cost of one can of dog food if the price is 4 for $ .93?

Solution: Start raising the price until you find a number that you can divide by 4 and leave no remainder.

$$\begin{array}{r} .23 \\ 4\overline{).93} \\ 8 \\ \hline 13 \\ 12 \\ \hline 1 \end{array}$$

Remainder is not zero.

Raise the price one penny.

$$\begin{array}{r} .23\\ 4\overline{).94}\\ \underline{8}\\ 14\\ \underline{12}\\ 2 \end{array}$$

Remainder still not zero.

Raise the price by a penny again.

$$\begin{array}{r} .23\\ 4\overline{).95}\\ \underline{8}\\ 15\\ \underline{12}\\ 3 \end{array}$$

Remainder still not zero.

Raise the price by one more penny.

$$\begin{array}{r} .24\\ 4\overline{).96}\\ \underline{8}\\ 16\\ \underline{16}\\ 0 \end{array}$$

The remainder is zero.

Therefore, the price of one can is $ .24

After you do many of these problems, you will probably do them by a quicker method. For instance:

Example 4: What is the cost of 1 can of soup if the bargain price is 5 for $1.11?

Solution: Instead of raising the price a penny at a time, simply divide 5 into $1.10 and get $ .22. You know now that if you had divided 5 into $1.11, you would have obtained an answer of $ .22 with a remainder. The remainder means that you automatically add another cent. The answer to this problem would then be $ .22 + $ .01 = $ .23

Example 5: Using the quicker method, find the cost of 1 can of soup if the price is 4 for $ .89.

Solution: Divide 4 into $ .88 and get $ .22. Since you would have gotten a remainder when you divided $ .89 by 4, the price of one can will be 22¢ + 1¢ = 23¢ Answer

6-7 EXERCISE A: Find the answers to the following using the quicker method.

Answers

1. Find the cost of one item if 2 cost $ .31. ______
2. " " " " one " if 2 cost $ .75. ______
3. " " " " two items if 3 cost $ .75. ______
4. " " " " two " if 4 cost $ .47. ______
5. " " " " two " if 5 cost $ .69. ______
6. " " " " three " if 4 cost $ .51. ______
7. " " " " three " if 5 cost $ .94. ______
8. " " " " one item if 6 cost $ .95. ______
9. " " " " one item if 5 cost $1.04. ______
10. " " " " two items if 5 cost $1.11. ______

In all of the preceding problems you were finding the price of an item when you were buying less than the bargain amount.

Now let us do a problem where you are buying more than the bargain amount.

Example 5: In a department store, the price of housecoats is three for $8.92. How much would 4 housecoats cost?

Solution: The first 3 housecoats will cost $8.92, which is the bargain price. Since you are buying four you must find the cost of one and then add the cost of one to the cost of three to find the total cost.

The cost of one housecoat will be:

Therefore, the cost of 4 housecoats will be:

3 cost $8.92
1 costs $2.98 Add
$11.90 Answer, Cost of 4 housecoats.

IMPORTANT: Do not find the cost of one housecoat and then multiply this cost by 4. If you do, you will get the wrong answer of 4 x $2.98 = $11.92. Doing the problem this wrong way does not allow the customer to benefit from the bargain pricing.

Example 6: What is the cost of four blouses at two for $4.49.

Solution: Here you are buying exactly twice as many as the bargain price.

Since 2 cost $4.49, then 2 more would cost another $4.49.

So four would cost 2 x $4.49 = $8.98

6-7 EXERCISES B: Find the cost of buying more or less than the bargain amount.

1. Find the cost of one can of soup if two cost $ .47.
Ans. $____

2. If two cans of dog food cost $ .45, how much does one can cost?
Ans. $____

3. Three cans of evaporated milk cost 49¢, how much does one can cost?
Ans. $____

4. Four cans of tomato past cost $ .61. Find the cost of one can.
Ans. $____

5. Green Giant corn costs 5 for $1.06. Find the cost of one can.
Ans. $____

6. If 6 cans of Campbell's soup cost $1.39, find the cost of two cans. Cost of one can is $____; 2 cost $____

7. Find the cost of two cans of tomato sauce if four cans cost 49¢. Cost of one is $______; 2 cost $____

8. Find the cost of three bottles of catsup if four cost $1.33. Cost of one is $______; 3 cost $____

9. Find the cost of three cans of soup if two cost $ .45. Cost of one is $______; 3 cost $____
(If your cost for 3 cans is $ .69 you are wrong! See example 5 on page 127.)

10. Find the cost of six cans of dog food if four cost $ .89. Cost of one is $______; 6 cost $____

11. What is the cost of 4 pillow cases at two for $ .89? (Hint: How many "times as many" are you buying?)

Ans. $_____

12. What is the cost of 6 blouses if two cost $4.49?

Ans. $_____

13. How much would 8 bed sheets cost at 2 for $4.39?

Ans. $_____

14. What would a dozen pair of hosiery cost if three cost $2.00?

Ans. $_____

15. What is the cost of 1½ dozen shirts at two shirts for $7.00?

Ans. $_____

16. What is the cost of 2 dozen pair of hosiery at 6 pair for $2.50?

Ans. $_____

17. How much would 15 pair of pants cost at three for $24.37?

Ans. $_____

18. Two sweaters cost $4.79. How much would a dozen cost?

Ans. $_____

19. Handkerchiefs sell at 3 for $1.00. How much would 30 cost?

Ans. $_____

20. If a dozen pair of socks sell at $3.59, how much would it cost to buy 4 pair?

Ans. $_____

21.

	If the Bargain Price is:	Then this many would cost					
		1	2	3	4	5	6
a	2 for 49¢						
b	3 for 55¢						
c	3 for 73¢						
d	4 for 59¢						
e	5 for 86¢						
f	6 for 83¢						
g	6 for 49¢						

6-8 Counting Change

One of the requirements of working as a cashier is to be able to count change fast and accurately. The following section will help you to do this.

Example 1: A customer in a store paid for a 65¢ purchase with a dollar bill. Show in what order you would take the change out of the cash register drawer and count it back to the customer.

Solution: You do not bother with subtracting 65¢ from $1.00 with pencil and paper. All you have to do is to start counting from 65¢ and stop when you reach $1.00.

You say to yourself .... 65¢

You give the customer 5¢, and say .... 70¢

You give the customer another 5¢ and say ... 75¢

You give the customer 25¢ and say $1.00

That's all there is to it.

Remember to give the change in order. For instance in the above problem, you would not give 25¢ first. Always give change in this order:

Pennies
Nickels
Dimes
Quarters
Half dollars
One dollar bills
Two dollar bills
Five dollar bills
Ten dollar bills
Twenty dollar bills

Example 2: List in order the change you would give for a purchase of $1.12, paid for with a 20 dollar bill. Also show what you would say as you gave out the coi and currency (bills).

Solution:

Change:	You Say:
1¢	$ 1.13
1¢	1.14
1¢	1.15
10¢	1.25
25¢	1.50
50¢	2.00
$1.00	3.00
2.00	5.00
5.00	10.00
10.00	20.00

Let us agree to give the fewest number of coins and currency when counting change. For instance:

Give	Instead of
One nickel	5 pennies
One dime	2 nickels, etc.
One quarter	25 pennies, or 5 nickels, etc.
One half dollar	2 quarters, etc.
One $2 bill	Two $1 bills

Even though these are becoming scarce, let us use them in our problems.

6-8 EXERCISES: Using the fewest number of coins and currency, list (a) what you would give for change and (b) what you would say.

1. Purchase of $ .12 paid for with $.50

Change	You Say

2. Purchase of $ .31 paid for with $1.00

Change	You Say

3. Purchase of $1.57 paid for with $5.00

Change	You Say

4. Purchase of $3.06 paid for with $10.00

Change	You Say

5. Purchase of $7.27 paid for with $20.00

Change	You Say

6. You have the following change in your cash register. You have no dimes, half dollars, or twenty dollar bills. List the number of coins and bills you would give for change.

CASH REGISTER DRAWER

$1.00 Bills	$2.00 Bills	$5.00 Bills	$10.00 Bills	~~$20.00 Bills~~
Pennies	Nickels	~~Dimes~~	Quarters	~~Half Dollars~~

Cost of Purchase		Amount Paid to Cashier	Coins or Currency									
			1¢	5¢	10¢	25¢	50¢	$1	$2	$5	$10	$20
a)	$ 3.47	$10										
b)	$ 8.09	$20										
c)	$10.22	$20										
d)	$ 9.08	$20										

7. In this problem you have no dimes, half dollars, two dollar bills, or ten dollar bills. List the change you would give. Cross out the coins and currency that you do not have in the drawer.

CASH REGISTER DRAWER

$1.00	$2.00	$5.00	$10.00	$20.00
1¢	5¢	10¢	25¢	50¢

Cost of Purchase		Amount Paid to Cashier	Coins or Currency									
			1¢	5¢	10¢	25¢	50¢	$1	$2	$5	$10	$20
a)	$21.68	$40										
b)	$26.31	$40										
c)	$22.22	$50										
d)	$18.06	$50										

6-9 Cash Register Slips

After a cashier in a grocery store adds up all the taxable items in a purchase, he must then find the sales tax at 3½% and add this to the bill.

Usually this is done automatically by the cash register. However, since it is difficult to do this kind of problem automatically on your machine calculator, you will have to perform the work in a series of steps.

Before we begin, you should understand that not all items are taxed-for instance, meat produce, and certain groceries. On the following cash register tapes you will see which items are taxable. The taxable grocery items are indicated like this: 00.43 TX GR. Other items are not taxed, and these are shown like this: 00.59 MT
00.37 PR
00.30 GR

Note: MT means meat; PR means produce; and GR means groceries. If you do not see TX next to an item it means the item is not taxable.

Example 1: Find the final bill for the following cash register slip.

00.45 PR
00.59 PR
01.78 MT
01.49 TX GR
01.29 TX GR
00.25 TX GR
00.25 TX GR
00.25 TX GR

Solution:

a) Which items are taxable?

Answer: The last 5 items are taxable.

b) What is the total of the 5 taxable items? Add these up on your machine and you should get $3.53. This is the amount to be taxed at 3½%.

c) The tax is 3½% of $3.53 = $ .12

d) Write in the tax of $ .12 under the last item on the slip. The slip should now look like step (e).

e) Add up all the items on the slip now and you should get an answer of $6.47. This is the final bill.

00.45 PR
00.59 PR
01.78 MT
01.49 TX GR
01.29 TX GR
00.25 TX GR
00.25 TX GR
00.25 TX GR
.12 Sales Tax (Written in with pencil)
$6.47 Final Bill

6-9 EXERCISES: Find the final bill for the bollowing cash register slips. TX means that the item is taxable at 3½% sales tax. It may help to put a check mark next to taxable items.

1. Sample Problem:

00.79 MT
00.75 MT
00.56 PR
00.49 TXGR
00.33 TXGR $2.85
00.60 TXGR x.035
00.98 TXGR .09975 = $.10 TAX
00.45 TXGR
.10 TAX
$ Bill

2. 00.36 MT

00.12 GR
00.12 GR
00.30 PR
00.80 TXGR
01.35 TXGR
00.85 TXGR
00.63 MT
_____ TAX
$ Bill

3. 00.17 PR

00.25 PR
00.76 MT
03.28 MT
00.46 TXGR
01.07 TXGR
00.55 TXGR
01.17 TXGR
_____ TAX
$ Bill

4. 03.39 MT
00.49 GR
00.19 GR
00.37 TXGR
00.42 GR
00.48 TXGR
00.50 TXGR
01.05 MT
00.40 MT
00.68 MT
_____ TAX
$ Bill

5. 00.67 GR
00.05 TXGR
00.05 TXGR
00.05 TXGR
00.05 TXGR
00.05 TXGR
00.32 GR
00.28 GR
00.35 PR
00.27 PR
_____ TAX
$ Bill

6. 01.29 MT
00.50 TXGR
00.24 TXGR
00.63 PR
00.24 PR
01.29 TXGR
00.12 GR
00.12 GR
00.21 GR
00.57 TXGR
_____ TAX
$ Bill

7. 00.98 TXGR
00.55 GR
00.73 GR
01.39 MT
01.78 MT
00.57 MT
00.63 MT
00.40 TXGR
00.32 TXGR
00.57 TXGR
_____ TAX
$ Bill

Next, you will find some actual cash register slips from a supermarket. In these problems, use a sales tax of 3¼%, instead of 3½%.

⑧
00.23 GR
00.49 GR
00.49 GR
00.33 GR
00.29 TX GR
00.21 TX GR
00.47 TX GR
00.47 TX GR
00.47 TX GR
00.47 TX GR
00.35 PR
00.99 MT

⑨
00.99 MT
00.67 GR
00.47 TX GR
00.67 GR
00.79 GR
01.24 MT
01.22 MT
00.54 PR
00.55 MT
01.39 MT
00.99 MT
00.69 MT

⑩
00.35 GR
00.49 GR
00.55 GR
00.43 TX GR
00.39 GR
00.23 GR
00.37 GR
00.23 TX GR
00.43 GR
00.49 GR
00.39 GR
00.40 GR

⑪
00.63 GR
00.35 GR
00.39 GR
00.27 GR
00.29 GR
00.29 TX GR
00.24 GR
00.34 GR
00.88 GR
00.35 TX GR
00.89 TX GR
00.43 TX GR

⑫
00.45 GR
00.31 TX GR
00.27 TX GR
00.29 TX GR
00.31 TX GR
00.17 GR
00.20 GR
00.59 GR
00.37 GR
00.49 TX GR
00.43 GR
00.83 TX GR

⑬

00.25 TX GR
00.25 TX GR
00.43 TX GR
00.49GR
00.39GR
00.81GR
00.59PR
00.54MT
00.73MT
00.39PR
00.35PR
00.37PR
00.18PR
00.25PR
00.49PR
00.43GR
00.39GR
00.23GR
00.27GR
00.29GR
00.24PR

⑭

00.27 TX GR
00.59GR
00.39GR
00.22PR
00.39PR
00.25PR
00.22PR
00.54MT
00.65MT
• 00.55MT
00.53GR
00.49MT
00.29GR
00.37GR
00.37GR
00.58MT
01.62MT
01.51MT

⑮

00.44PR
00.44PR
00.44PR
00.59 TX GR
01.49 TX GR
01.29 TX GR
00.75GR
00.39GR
00.43GR
00.43GR
00.23GR
00.39GR
00.33GR
00.28GR
00.28GR
00.49PR
00.49PR

⑯

00.43GR
00.43GR
00.40GR
00.33PR
01.27MT
00.88MT
00.31 TX GR
00.31 TX GR
00.31 TX GR
00.31 TX GR
00.31 TX GR
00.31 TX GR
00.45 TX GR
00.93GR
00.89GR
00.78GR
00.93GR
00.83 TX GR

⑰

00.89GR
00.89GR
00.45 TX GR
00.47PR
00.97 TX GR
00.24GR
00.24GR
00.98 TX GR
00.25 TX GR
00.41PR
00.63GR
01.17GR
00.89PR
00.24GR
00.24GR
00.29 TX GR
00.25 TX GR
00.39GR
00.75GR
00.39GR
00.51GR
00.51GR
00.27GR

⑱ (Optional)

Using counting numbers and zero, complete the information with the given limitations.

12 - _____ = _____ + _____

Number of Ways

(a) Using any counting numbers and zero......
(b) Using only even numbers..................
(c) Use only odd numbers.....................
(d) Using only multiples of 3 (including zero)
(e) Using multiples of 7 (including zero).....
(f) Using multiples of 6 (including zero).....

6-10 Averages

The word "average" means something that represents the middle point. In arithmetic, average means a number that can be used to represent the middle point of a group of numbers.

For example, the average of 6 and 8 is 7, because 7 is in the middle of 6 and 8. The average of 10 and 11 is 10.5; the average of 70, 80, 90 is 80; the average of 50, 60, 70, 80 and 90 is 70. In all of these examples, the average is the number that represents the middle point of a group of numbers.

Many times it is difficult to see what the average of a group of numbers is at a glance. For instance, the average test score of the test marks 94,63, 45, 78, 60, 68,even if rearranged as 45, 60, 63, 68, 78, 94, is not easy to be seen immediately. To find the average, or middle point, of these numbers, simple add the test marks together and divide their sum by the number of tests. The sum of these test marks is 408. Divide 408 by 6 (number of tests) and get 68 an as average.

Example 1: Find the average earnings of a person whose pay checks were $120, $125, $118, $132, $110, $105. Round your answer off to the nearest dollar.

Solution: Add $120

$$\begin{array}{r} \$120 \\ 125 \\ 118 \\ 132 \\ 110 \\ \underline{105} \\ \$710 \end{array}$$

$710 Sum of 6 pay checks

Divide:

$$\begin{array}{r} 118.3 \\ 6\overline{)710.0} \end{array}$$ = $118, average earnings rounded off to nearest dollar.

Example 2: Find the average sales per week for the shoe department of a store if sales were $240.77, $285.28, $220, $303, $250.29. Round off answer to nearest cent.

Solution: Complete the solution yourself.

Add: $240.77 Divide:
285.28 $5\overline{)\quad\quad\quad}$ = $
220.00
303.00
250.29
$ Sum of 5 weeks sales.

The answer is $249.87.

6-10 EXERCISES A: Find the averages for these problems. Round off your answer as indicated in each problem.

1. Find the average mark for these tests: 68, 79, 85, 52, 83, 88, 61. (Nearest unit) Ans. ______

2. The heights of 7 boys were 73", 68", 70", 62", 65", 75", 71". Find their average height. (Nearest inch) Ans. ______

3. Find the average sales per week for the dry goods department of a store if sales were $190, $187.30, $137.55, $120, $95, $208.43. (Nearest cent) Ans. ______

4. A sales clerk made 25 sales one day. The total amount of the sales was $1348.32. Find the average amount of a sale. (Nearest dollar) Ans. ______

5. Find the average earnings of a person whose weekly pay checks were $84.35, $80.20, $94.60, $89.11, $97.20 $90, $80, $82.25, $87.78. (Nearest cent) Ans. ______

Some special averages that you are familiar with are:

a) Finding your report card grade for each marking period.

b) Batting averages for baseball players.

Example 3: Find your report card grade if your quiz marks were 73, 79, 100, 100, 55, 68, 88, 93, 70 and your final test mark was 88.

To find your report card grade a special formula is used. The formula is: $G = \frac{2D + T}{3}$, where G is the report card Grade, D is the Daily average, and T is the final Test mark.

Solution:

a) First find your Daily average D:

Add:
$$\begin{array}{r} 73 \\ 79 \\ 100 \\ 100 \\ 55 \\ 68 \\ 88 \\ 93 \\ \underline{70} \\ 726 \end{array}$$
726 Sum of 9 quiz marks

Divide: $9\overline{)726.0}$ = 80.6 = 81, Daily Average

b) Double your Daily average

2 x 81 = 162

c) Add 162 to your final Test mark, 88.

Add:
$$\begin{array}{r} 162 \\ \underline{88} \\ 250 \end{array}$$

140

d) Divide 250 by 3 and get 83.3 = 83, your report card Grade.

Using the formula, your solution would look like this:

$$G = \frac{2D + T}{3}$$

The number 3 represents 2 daily averages and 1 final test mark.

$$= \frac{2 \times 81 + 88}{3}$$

$$= \frac{162 + 88}{3}$$

$$G = \frac{250}{3} = 83.3 = 83, \text{ report card Grade}$$

Notice that your daily average counts twice as much as your final test mark. This fact may help you to remember how to do this kind of problem if you forget the formula:

a) Find your daily average.

b) Double it.

c) Add your answer to your final test mark.

d) Divide your answer by 3.

6-10 EXERCISES B: Find the marking period grades in the following problems. Round off answers to nearest unit.

	Quiz Marks									Daily Average	Final Test Mark	Marking Period Grade
1.	84	92	100	100	80	95	100	80	82		95	
2.	73	90	83	62	75	50	62	70	65		60	
3.	50	70	70	70	65	60	50	50	60		50	
4.	78	75	72	80	83	70	—	68	84		88	
5.	90	88	73	78	85	65	73	—	—		60	

Note: In finding daily average, divide by number of quizzes taken.

6. A student had quiz marks of 62, 68, 70. What mark must he get on his next quiz to have an average of 75? (Hint: An average of 75 on four tests gives a total of 300 points (4 x 75 = 300.) How many total points did the student get on his first three tests?)
Ans. ______

7. A student had quiz marks of 72, 75, 78. What mark must he get on his next quiz to have an average of 80?
Ans. ______

8. A student's daily average is 70. What mark must he get on this final test to have an average of 80? (Remember: The daily average counts twice as much as the final test mark.)
Ans. ______

Example 4: A baseball player was "at bat" 252 times and got 85 hits. Find the average number of hits he got, based on the number of times at bat. Round your answer off to the third decimal place.

Solution: His average will be:

$$\frac{85}{252} \quad \begin{array}{r} .3373 \\ 252\overline{)85.0000} \end{array} = .337$$

This average means that he could be expected to get 337 hits if he were at bat 1000 times, or about 34 hits for 100 times at bat, or about 3 hits for every 10 times at bat.

6-10 EXERCISES C: Find the answers to the following problems and round off as indicated.

1. What is your daily average if your quiz marks were 95, 93, 78, 85, 60, and 68? (Nearest unit) Ans. ______

2. If you earned $83, $93, $89, $90, $95, $82, $79, and $92 for 8 successive weeks, what is your average pay? (Nearest dollar) Ans. ______

3. If you sell $108.22 worth of merchandise in a day by means of eleven sales, how much is your average sale? (Nearest cent) Ans. ______

4. Find the average sales per week for the clothing department of a store if sales were $804, $929.48, $1130.40, $890, $1039.45, $1107.09, $829.98. (Nearest cent) Ans. ______

5. The total commission earned by a salesman for an eight week period was $620. What was his average commission per week? (Nearest Dollar)

6. A baseball player played in 6 games. The following is his record of times at bat and number of hits. Find his batting average after the sixth game. Round off your answer to the third decimal place. Ans. ______

Game	At Bat	Hits
1	3	1
2	2	0
3	4	3
4	3	3
5	3	1
6	4	2

7. Find the report card mark for each pupil in the following math class. (Round off answers to nearest unit.)

Pupil's Name	Quiz Marks							Daily Average	Final Test	Report Card Mark
1. Battle, John	73	75	87	90	100	100	80		70	
2. Cohn, Harry	62	50	58	73	63	68	72		78	
3. Fortin, Larry	55	68	73	73	73	79	70		55	
4. Jacobs, John	88	80	76	100	75	89	92		70	
5. Levy, Charles	45	80	62	65	73	55	60		78	
6. Moran, Richard	100	83	92	95	75	75	—		94	
7. Pazder, John	68	—	75	80	75	84	—		90	
8. Abroms, Gloria	87	90	—	92	78	70	86		82	
9. Charles, Doris	60	55	69	73	73	79	—		55	
10. Cyr, Priscilla	84	63	75	100	95	95	90		96	
11. Grous, Mary	100	100	78	86	100	—	95		94	
12. Hill, Patricia	63	—	50	87	65	—	73		62	
13. Kelso, Pauline	100	90	87	90	—	92	83		100	
14. Rogers, Wyline	70	70	70	—	62	83	80		80	
15. Venora, Linda	50	62	58	75	70	69	—		50	

8. A boy had quiz marks of 73, 78, 63, 80, 85, 60. What mark must he get on his next quiz to get an average of 75? (Nearest unit) Ans. ______

9. If your daily average is 60, what mark must you get on your final test to have a marking period grade of 70? (Nearest unit) Ans. ______

10. If your daily quiz marks are 88, 72, 78, 65, 90, 100, 91, 93, what mark must you get on your final test to have a report card grade of 90? Ans. ______

11. Find the batting averages of the following major league baseball players. (Nearest thousandth)

American League

Player's Name	At Bat	Hits	Batting Average
Robinson	252	85	
Kaline	235	77	
Yastrzemski	295	96	
Carew	293	93	
Petrocelli	243	71	
Blair	267	73	
Conigliaro	233	68	

National League

Player's Name	At Bat	Hits	Batting Average
Cepeda	303	108	
Clemente	304	106	
Staub	270	94	
McCarver	238	82	
Gonzalez	223	76	
Aaron	302	100	
Rose	296	97	

6-11 Cost, MarkUp, Selling Price

COST:

Department stores must buy their merchandise from a wholesaler. Whatever the store pays to buy this merchandise is called the COST to the department store.

MARK UP:

The store now wants to sell this merchandise to its customers. The store will not sell the merchandise to you for the same COST. If it did, the store would not make a profit on the merchandise. So, the store marks the merchandise at a higher price. This added amount is called MARK UP. (Later you will see that the mark-up is not all profit.)

SELLING PRICE:

The SELLING PRICE of the merchandise is found by simply adding the MARK UP AND THE COST. As a formula, this fact could be written: SP = Mark Up + Cost

Example 1: Find the Selling Price of a pair of men's slacks if the Cost to the store is \$8.25 and the Mark-Up is \$4.89.

Solution: SP = Mark Up + Cost

SP = \$4.89 + \$8.25

SP = \$13.14, Answer

Example 2: The selling price of a dress is \$15.37. The mark-up is \$5.09. What did the dress cost the store?

Solution: We know the selling price is \$15.37. We also know that part of the selling price is the mark-up, \$5.09. How will we find the missing part of the selling price - that is, how will we find the Cost?

If you have decided to subtract the mark-up from the selling price, you are correct!

So, Cost is $15.37 - $5.09 = $10.28, Answer

Example 3: Find the mark-up on a handbag that is selling for $5.95 if the department store paid $3.52 for it.

Solution: Find the missing part - which, in this problem, is the mark-up.

Mark Up will be $5.95 - $3.52 = $2.43

Many times the mark-up is expressed as a certain per cent of the cost.

Example 4: What is the selling price of a bicycle that has a cost of $22.98 and a mark-up that is 35% of the cost?

Solution: What do we know?

We know that:

a) The cost is $22.98, and that

b) The mark-up is 35% of the cost, or

35% x $22.98

.35 x $22.98 = $8.0430

The Mark Up is $8.04.

c) SP = Mark Up + Cost

SP = $8.04 + $22.98

SP = $31.02

6-11 EXERCISES: Find the missing values in the following problems.

1.	Cost	Mark-Up	Selling Price
a)	$ 7.40	$ 2.85	$
b)	$21.49	$7.03	$
c)	$	$5.19	$32.00
d)	$14.48	$	$19.89
e)	$ 3.75	25% of Cost	$
f)	$	$450.37	$1400
g)	$827	12½% of Cost	$

2. A department store is selling handbags at $2.49 each. A Mark-Up of $ .89 had been included on each handbag. What was the cost of the handbags to the store? Ans. ______

3. G. Fox & Co. is selling dresses at $7.23 each. Find the mark-up if the cost of dresses is $5.79 each. Ans. ______

4. A store buys 100 dresses at a total cost of $342.50. It wants to have a mark-up of $1.09 per dress. What should be the selling price of each dress? Ans. ______

5. Brown-Thompson Co. bought 50 dresses at a cost of $163. The mark-up on each dress is to be 35% of its cost. What will be the selling price of each dress? Ans. ______

6. E. J. Korvette purchased a dozen golf bags at a cost of $9.39 each. If the mark-up is to be 40% of the cost, what is the selling price of a golf bag? Ans. ______

7. Sears Roebuck Co. purchased twenty-five portable T.V. sets at a cost of $2,468.75. The mark-up on each set is to be 28½%. Find the selling price of a set. Ans. ______

8. A drug store has purchased a carton of toothpaste which contains 6 dozen tubes of toothpaste. The cost of the carton was $40.32. The mark-up for a tube is to be 18¢. What will a tube of toothpaste sell for? Ans. ______

9. A drug store purchased bottles of aspirin at a cost of 68¢ per bottle. The mark-up is to be 19¢ per bottle.

a) Find the selling price of a bottle of aspirin. Ans. ______

b) How much would a customer pay for a bottle of aspirin if the sales tax is $3\frac{3}{4}$%? Ans. ______

10. A store bought three dozen bottles of shaving lotion at a cost of $24.98. The mark-up is to be 30% of the cost.

a) Find the selling price of a bottle of shaving lotion. Ans. ______

b) If shaving lotion were on sale at a 20% discount, what is the discount price of one bottle? Ans. ______

c) If you bought one bottle during this sale, how much would you pay for it if the sales tax was 3½%? Ans. ______

6-12 Mark Up, Profit, and Overhead

You have now worked with the relationship between selling price, mark-up, and cost.

In this chapter you will see the relationship between mark-up, PROFIT, and OVERHEAD.

Mark-up is made up of two parts. One part is Profit and the other part is Overhead. As a formula it would look like this: Mark-Up = Profit + Overhead

You can see now why, on page 146, it was stated that Mark-Up is not all Profit.

First, what is Overhead? Overhead is the expense of running a store. Overhead is found by adding up all the expenses of:

a) Paying the employees who work in the store.
b) The cost of electricity, water, heat, gas.
c) Repair work on the store.
d) Paying off loans on money that the store may have borrowed.
e) Do you know of any other expenses?

All of these expenses are called the Overhead. The store charges you a little bit extra when you buy merchandise, so really you are paying for the expense of running the store. Each item in the store has a part of the total overhead in its mark-up.

What is Profit? Profit is the money that the store makes after all its expenses are paid.

Summary: The Mark-Up on an item is made up of two parts - Profit and Overhead. The mark-up is found by adding these two parts together.

So, Mark-Up = Profit + Overhead

Example 1: Find the mark-up on an item that is to be sold at a profit of $7.50 and has an overhead of $9.00.

Solution: Mark-Up = Profit + Overhead

Mark-Up = $7.50 + $9.00

Mark-Up = $16.50, Answer

SUMMARY:

The following table may help you to remember the relationship between selling price, cost, mark-up, profit, and overhead:

Selling Price		
Cost of item	Mark Up	
	Overhead	Profit

From this table you find that:

Selling Price = Cost + Mark Up, or

Selling Price = Cost + Overhead + Profit, because

Mark Up = Overhead + Profit

6-12 EXERCISES: Find the missing values in the following problems.

1. What is the mark-up if the profit is $6.85 and the overhead is $7.49? Ans. ______

2. Find how much a store marked-up the price of a coat if the overhead was $11.08 and the profit was to be $14.87. Ans. ______

3. The mark-up on an item is $17.45 and the store made a profit of $8.00. How much was the overhead on the item?
Ans. ______

4. The mark-up on a toaster is $3.49 and the overhead is $1.12. How much profit can be made? Ans. ______

5.	Profit	Overhead	Mark-Up	Cost	Selling Price
a)	$125	$320	$	$950	$
b)	$ 20	$ 24.75	$	$120.40	$
c)	$ 7.19	$	$10.78	$ 29.78	$
d)	$	$ 7.24	$16.98	$53.21	$
e)	$ 5.09	$ 6.00	$	$	$56.00
f)	$ 12.78	$	$30.00	$	$123.49
g)	$150	$100.00	$	$	$1500.00
h)	$ 83.05	$109.50	$	$	$ 812.11
i)	$	$ 4.08	$ 12.36	$ 43.22	$
j)	$	$ 8.64	$	$ 24.08	$ 32.55

6. A table lamp cost a store $18.28. The profit was $3.55 and the overhead was $2.45. Find:

a) The mark-up Ans. ______

b) The selling price Ans. ______

7. The selling price of a TV set is $160.24. The store bought the set for $114.14. Overhead was $15.07. Find:

a) The mark-up Ans. ______

b) The profit Ans. ______

6-13 Finding the Selling Price

Many times a store determines the selling price of its items in the following manner:

a) The profit is fixed as a per cent of cost.

b) The overhead is fixed as a per cent of cost.

Example 1: The cost of a table is $30. The profit is to be 15% of the cost and the overhead is to be 20% of the cost. Find the selling price.

Solution:

a) We can find the profit easily by taking:

15% of the cost

15% x $30.

.15 x $30 = $4.50, Profit

b) We can find the overhead by simply taking:

20% of the cost

20% x $30

.20 x $30 = $6.00, Overhead

c) If profit and overhead are added together we can find the mark-up.

Mark Up = Profit + Overhead

Mark Up = $4.50 + $6.00

Mark Up = $10.50

d) The selling price can now be found by adding together the mark-up and the cost.

Selling Price = Mark Uo + Cost

Selling Price = $10.50 + $30.00

Selling Price = $40.50, Answer

6-13 EXERCISES: Find the selling price in the following problems.

1. A suit cost $29.75. The profit is to be 15% of the cost and the overhead is to be 20% of the cost. Find the selling price. Ans. ______

2. The cost of an electric range is $143.75. The profit and overhead each are 15% of the cost. Find the selling price. Ans. ______

3. A 22 caliber rifle costs a store $18.20. The profit is fixed at $22\frac{1}{2}$% and the overhead at $14\frac{1}{2}$%. Find the selling price. Ans. ______

4. The cost of a sofa to a store is $138. If the profit is to be $33\frac{1}{3}$% of the cost and the overhead is to be $\frac{1}{10}$ of the cost, find the selling price. Ans. ______

5. A set of golf clubs cost a store $73.42. The overhead is $\frac{3}{20}$ of the cost and the profit is $\frac{1}{8}$ of the cost. Find the selling price. Ans. ______

6-14 Per Cent Mark Up

The mark-up on an item is $10 and the selling price is $40. What is the per cent mark-up, based on the selling price?

This problem asks the question: What per cent is $10 of $40, or, what per cent of $40 is $10? In either case, you are comparing a part of the price to the whole price. Whenever you compare a part of the price to the whole price, the whole price automatically becomes the denominator of a fraction.

The per cent mark-up will then be:

$\frac{\$10}{\$40} = .25 = 25\%$, Answer

In department stores, the mark-up is always based on the selling price. The selling price is the whole price and is always the denominator of the fraction.

6-14 EXERCISES: Find the per cent mark-up, based on the selling price. Express answers to nearest 1%.

1. Mark-up is $12 and selling price is $48. Ans. ______
2. Mark-up is $11 and selling price is $33. Ans. ______
3. The selling price is $60 and the mark-up is $18. Ans. ______
4. The selling price is $47 and the mark-up is $15. Ans. ______

	Cost	Selling Price	Mark-Up	Per Cent Mark Up
5.	$10	$13		
6.	$30	$40		
7.	$95.73	$126.40		
8.	$ 6.98	$ 8.17		
9.	$60.25	$ 92.79		
10.	$305.22	$398.89		
11.	$620	$845.69		

6-15 Per cent Increase or Decrease

The jewelry department of a store had sales of $625 last week. This week sales were $850.

a) Did sales increase or decrease? – – – – – Ans. ____________

b) By how much did sales increase?

Sales increased by $850 - $625 = $225.

c) What was the per cent increase in sales?

The per cent increase was $\frac{\$225}{\$625} = .36 =$ 36% increase

In the above problem do you find that you must first subtract the amount of sales for the two different weeks? Do you see that the per cent increase in sales is found by dividing the amount of increase ($225) by the amount of sales for the first week ($625)?

Example 1: In the children's clothing department, sales for one week were $1,840. During the following week sales were $1695. What was the per cent increase or decrease in sales?

Solution:

a) Did sales increase or decrease? Ans. ____________

b) By how much was the increase or decrease?

Sales went from $1840 to $1695. This is a decrease of $145.

c) What was the per cent increase or decrease in sales?

The % decrease is $\frac{\$145}{\$1840} = .078 =$ 8% decrease

Notice that you divide by $1840, the sales for the first week.

Your answer in this type of problem must state two things:

1) The per cent, and,

2) The word "increase" or "decrease"

6-15 EXERCISES: Find the per cent increase or decrease. Be sure to write the word "increase" or "decrease" next to your answer. Round off answers to nearest one per cent.

1. During the first week of June, sales for the shoe department were \$245. During the second week sales were \$280. Find:

a) The increase or decrease in sales Ans. \$______

b) The per cent increase or decrease Ans. ___%, ______

2. During May of 1966, sales for sporting goods department were \$8,459. During May of 1967, sales were \$8,059. What was the per cent increase or decrease in sales?

Ans. ___%, ______

3. The June sales of this year for a grocery store were \$6,347. Sales for June of last year were \$5,846. What was the per cent increase or decrease in sales? Ans. ___%, ______

4. One week a TV set cost \$187.75. The week before this, the set cost \$205.48. What was the per cent increase or decrease in the cost of the T.V. set? Ans. ___%, ______

5. A store was selling jackets priced at \$18.00. It decided to have a sale and sell the jackets for \$13.00. What was the per cent increase or decrease? Ans. ___%, ______

6. Men's shoes were selling at \$12.89 a pair and are now priced to sell at \$9.89 a pair. What is the per cent increase or decrease? Ans. ___%, ______

7. During a sale, a bedroom suite was selling for $199. After the sale, the selling price was $239.95. What was the per cent increase or decrease? Ans. ___%, _____

8. Last week a machine operator earned $163.29. This week he worked overtime and made $193.62. What was the per cent increase or decrease in his earnings? Ans. ___%, _____

9. During the past school year, enrollment at a high school was 1579. This year, enrollment is expected to be 1780. What is the expected per cent increase or decrease in enrollment? Ans. ___%, _____

10. The number of cars crossing the Charter Oak Bridge per week was 18,460 on the average. Because I-84 highway has been completed, the average number of cars crossing the bridge is now 4,547. What is the per cent increase or decrease in number of weekly crossings? Ans. ___%, _____

6-16 Commission

Salesmen are paid in many different ways:

A) The most simple method of paying salesmen is to allow them to earn a certain percentage of whatever they sell. The amount that the salesman receives is called his commission.

Example 1: A real estate salesman receives a 6% commission when he sells a home. What is his commission when he sells a home that is worth $24,000?

Solution: The salesman gets 6% of $24,000?

6% x $24,000

.06 x $24,000, or

$1,440, Answer

B) The next way a salesman may be paid is to pay him a salary for the week and also a commission on what he sells during the same week.

Example 2: A salesman's weekly salary is $90 per week. He also receives a 2% commission on his sales. What are his weekly earnings when his sales were $2,000?

Solution: There are two parts to his weekly earnings.

a) He gets $90 as a salary (even though he may not sell anything).

b) He gets a commission of 2% of $2000

2% x $2000

.02 x $2000 = $40

His weekly earnings are now found by adding his salary and his commission.

$90 + $40 = $130, Answer

C) Another way to pay a salesman is to pay him a salary, plus a commission based on how much he sells over a certain quota.

Example 3: A salesman receives a weekly salary of $85. In addition, he receives a 1½% commission on all sales OVER $5000. What does he earn during a week when his sales were $12,000?

Solution:

a) He gets $85 per week as salary.

b) He is expected to sell at least $5000 worth of merchandise. For this $5000, he gets no commission!

c) His sales were $12,000 for the week. How much OVER $5000 is $12,000? Ans. $______

d) His commission will be 1½% of $7000, or, $105.

e) His weekly earnings are:

$ 85 for salary
105 for 1½% of $7000
$ 190 for weekly earnings

6-16 EXERCISES: Find the earnings for the following salesmen.

1. Commission is 6% of sales and sales are $30,000. Ans. ______

2. Commission is 4½% of sales and sales are $15,700. Ans. ______

3. A salesman's salary is $90 a week plus 1½% of his sales. What are his earnings if his sales were $7,000? Ans. ______

4. A salesman's commission is 2½% of his sales plus a $75 weekly salary. His sales one week were $8400. Find his weekly earnings. Ans. ______

5. A manager of a dairy makes a weekly salary of $125, and gets 4% of all sales over $1000. Compute his weekly earnings for a week when sales were $1500. Ans. ______

6. A truck rental salesman's weekly salary is $95. In addition he gets 1% of all sales over $7000. If sales were $24,500 one week, what are his earnings? Ans. ______

7. A salesman's weekly salary is $105. His commission is 5½% of his sales. What does he earn when he sells $2500 worth of goods? Ans. ______

8. A salesman receives $80 a week plus a commission. His commission is based on a quota of $7000. Use the following table to find his commission when his weekly sales were $15,000:

If sales over quota is between:	He gets
$ 0 and $2,999 ---------	1% commission of all sales over quota
$3000 and $6,999 ---------	1¼% " " " " " "
$7000 and $9000 ---------	1½% " " " " " "

Find his weekly earnings. Ans. ______

9. Using the table in problem 8, find the weekly earnings of a salesman whose salary is $90 per week, whose sales were $8,500, and whose quota is $5,000. Ans. ______

10. Using the table in problem 8, find the weekly earnings of a salesman who gets a salary of $105 per week if his quota is $3000 and his sales were $9500. Ans. ______

11. Using the table in problem 8, find the weekly earnings for a salesman whose salary is $110 per week. His quota is $1000 and his sales were $3500. Ans. ______

6-17 Review Exercises

1. Find how much change you would receive if you paid for the following purchases with a $20 bill: $.09, $2, $.87, $.50, $.25, $1.80, $3, $1.05, $.63, $.43. Ans. ______

2. Find the cost of five gallons of floor varnish at a cost of $4.29 per gallon . Ans. ______

3. The price of dozen shirts is $39. What is the price of a shirt? Ans. ______

4. Flour can be bought in 2 lb. bags for 25¢. A 10 lb. bag costs $1. How much can be saved by buying flour in the 10 lb. bag? Ans. ______

5. Jam sells at $ .48 for a 1½ lb. jar. A small 6 oz. jar costs $ .17. How much can be saved by buying the 1½ lb. jar instead of the smaller jars? Ans. ______

6. How much would you pay for a purchase of $12.43 if the sales tax is 3½%?

7. If sales tax is 3½%, how much would 5 lawn chairs cost at a price of $3.29 each? Ans. ______

8. During a sale, blankets are marked " $\frac{3}{8}$ off." What is the discount price if blankets originally sold for $9.49? Ans. ______

9. The regular price of a toaster is $12.15. During a 20% sale, how much would you pay for the toaster if sales tax is 3½%? Ans. ______

10. If four cans of dog food cost $ .89, how much would one can cost? Ans. ______

11. Five cans of soup cost $1.06. Find the cost of three cans. Ans. ______

12. Six cans of soda cost $ .67. How much would eight cans cost?

13. The cost of a dozen pair of socks is $4.80. How much would 1½ dozen cost? Ans. ______

14. Two sweaters cost $5.25. How much would 6 sweaters cost? Ans. ______

15. Using the fewest number of coins and currency, list what you would give for change and what you would say as you gave the customer his change.

a) Purchase of $ .83 paid for with a $5 bill.

b) Purchase of $3.04 paid for with a $20 bill.

FILMED FROM BEST AVAILABLE COPY

16. Find the final bills for these grocery slips if sales tax is 3½%.

a) 00.33 PR
00.87 PR
00.39 GR
00.47 TXGR
01.38 TXGR
01.08 GR
00.84 MT
00.12 TXGR

b) 01.07 TXGR
00.30 TXGR
00.75 MT
00.69 MT
00.98 MT
01.32 TXGR
00.80 GR
00.12 PR

c) 00.05 TXGR
00.05 TXGR
00.05 GR
00.05 GR
00.15 TXGR
01.15 TXGR
00.25 TXGR
01.25 GR

17. What is the daily average of the following tests?
100, 95, 82, 93, 65, 73, 78, 80, 50, 55, 68 Ans. ______

18. If your daily average is 82 and your final test mark is 70, what is your marking period grade? Ans. ______

19. If your daily average is 73, what mark must you get on your final test to get an average of 80? Ans. ______

20. If a baseball player was at bat 250 times and got 81 hits in 40 games, what was his batting average? Ans. ______

21. The mark-up on a coat is $3.49 and the cost is $29.47. What is the selling price? Ans. ______

22. The cost of a dress is $4.75 and the selling price is $7.95. What is the mark-up? Ans. ______

23. Sage Allen Co. bought 30 dresses at a cost of $360. The mark-up is to be 30% of the cost. Find the selling price of each dress. Ans. ______

24. A store bought a dozen bottles of hand lotion at a cost of $24.20. The mark-up is to be 20% of the cost.

a) Find the selling price on one bottle. Ans. ______

b) If hand lotion is on sale at a discount of 10%, what is the discount price of a bottle? Ans. ______

c) How much would you pay for a bottle during this sale if sales tax is 3½%? Ans. ______

25. The profit and overhead on an item are both to be $3.49. What is the mark-up? Ans. ______

26. The mark-up on an item is $14.95 and the store made a profit of $6.37 when selling it. How much was the overhead on the item? Ans. ______

27. The selling price of an article is $30.98, the cost is $21.60, and the overhead is $6.20. What is the profit and mark-up? Profit ____ Mark-up ______

28. A coat cost a store $18.95. The profit is to be 22% of the cost and the overhead is to be 18% of the cost. What is the selling price? Ans. ____

29. If the mark-up is $11 and the selling price is $50, what per cent is the mark-up of the selling price? Ans. ______

165

30. The cost of an article is $25 and the selling price is $43.98. What is the per cent mark-up, based on the selling price? Ans. ______

31. During Dec., 1965, sales in a department store were $12,470. During the previous month of Dec., sales were $11,080. What was the per cent increase or decrease in sales?
Ans. __%, ______

32. During a sale, a dining room set cost $135. After the sale, the price of the set was $150. What was the per cent increase or decrease? Ans. __%, ______

33. A real estate salesman's commission is 5½% of his sales. What was his commission during a month when his sales were $75,000? Ans. ______

34. A salesman's commission is 2¼% of his sales. His weekly salary is $75. What are his earnings during a week when his sales were $2350? Ans. ______

35. A salesman's weekly salary is $105. His commission is 1½% of all sales over $5,000. What is his weekly pay if his sales were $11,800? Ans. ______

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

BASIC MATHEMATICS
machine calculator course

a text-workbook
BOOK 3

1969
revised

Windsor Public Schools

TABLE OF CONTENTS

Chapter VII - Business Activities

Page

7-1 Invoices 167
7-2 Sales Tax and Labor Charges 168
7-3 Extended Payment 176
7-4 Industrial Buying - Discounts 179
7-5 Successive Discounts 180
7-6 Using Complements 185
7-7 Discounts - Applications 187
7-8 Freight Rates 192
7-9 Combination Problems 195
7-10 Finding the Per Cent of Discount 203
7-11 Renting or Leasing Trucks 205
7-12 Truck Rental 212
7-13 Time Cards 218
7-14 Time Cards - Rates of Pay 222
7-15 Time Cards - Piece Work 226
7-16 Payroll - Income Tax 227
7-17 Payroll - Social Security 231
7-18 Payroll - Summary Sheets 232
7-19 Review Exercises 239
7-20 **Extra Blank Forms** 245a

Chapter VIII Using Formulas Page

8-1 Definition 246

8-2 Order of Operations 248

8-3 Raising to Powers 249

8-4 Parentheses 253

8-5 Writing Formulas 257

8-6 Averages 260

8-6A Arithmetic Mean 260

8-6B Batting Average 260

8-6C Earned Run Average 261

8-6D Miles Per Gallon 261

8-6E Average Rate 262

8-6F Summary 262

8-7 Evaluating Formulas 265

8-8 Scientific Formulas 266

8-9 Miscellaneous Formulas 269

8-10 Review Exercises 271

Number Patterns 272

Chapter VII

BUSINESS ACTIVITIES

CHAPTER VII
Business Activities

7-1 Invoices

An invoice is a bill that the seller sends to the buyer listing the terms of purchase, the quantity or amount, description, and the unit price of each item purchased. It also includes:

(1) The extension for each item found by multiplying the number of each item by its unit price.

(2) The total amount of the bill, found by adding the extensions.

The buyer should always check the invoice when it is received to see that the goods listed on it are the ones he ordered and that the prices are those that were agreed upon with the seller.

When the goods are delivered, the items should be checked with the invoice to see if all items have been received. The extensions and the total amount should then be checked to see that no errors have been made.

7-1 Exercises: Complete the following.

	Quantity	Description	Unit Price	Extension
1.	60	Cabinet Hinges	$1.12	
2.	70	Drawer Pulls	$1.50	
3.	24	Cutting Pliers	$1.75	
4.	36	Drills	$3.05	
5.	30	Door Catches	$ .31½	
6.	6	Hammers	$3.59	
7.	5 gal.	Varnish	$3.79/Gal.	
8.	5 gal.	Turpentine	$1.35/Gal.	
9.	2	3 inch Brushes	$1.25	
10.	6 boxes	Nails	$ .59	

pg 167

What is the total amount of the above?

Total Amount ______

7-2 Sales Tax and Labor Charges

Sales tax must also be included on the invoice in those states where it applies. At the present time, the sales tax in Connecticut is 3½%.

Another item that is included on invoices is a charge for labor. Labor costs are not taxable. They should be added after the sales tax has been computed.

Example 1:

ESTABLISHED 1830
EDWARD W. MACK & SON
MANUFACTURER AND DISTRIBUTOR
Mack's Harvard Brick
WINDSOR, CONNECTICUT

Sold to: Atlas Const. Co.
Wethersfield, Conn.

Date: 10/10/67

Quantity	Description	Price	Amount
6,000	Penn. waterstruck	$81.50/1000	$489.00
1,000	Random used brick	35.00/1000	35.00
		Total Mdse.	$524.00
		3½% State Tax	18.34
	Labor - loading & deliver		32.00
		TOTAL	$574.34

7-2 EXERCISES: The following price list is to be used on the examples that follow.

The retail price is how much an individual automobile owner pays.

The wholesale price is how much a repair shop pays.

A sales tax of 3½% must be computed for all invoices.

Description	Retail Price	Wholesale Price
Muffler	$17.25	$13.00
Tail Pipe	6.55	4.59
Exhaust Pipe	6.85	4.80
Spark Plug	1.05	.70
Points	3.09	2.17
Condenser	1.08	.74
Voltage Regulator	15.37	10.78
Coil	7.80	6.24
Starter	54.52	43.62
Battery	33.95	23.77
Generator	57.58	40.32
Distributor	29.25	20.48

THE A. C. HINE COMPANY
189 WASHINGTON STREET
HARTFORD, CONN. 06106

PURCHASE ORDER
Nº 6351
THE ABOVE NUMBER SHOULD APPEAR ON YOUR INVOICE

TO Mr. Thomas Wheeler
STREET 55 Victor Rd.
CITY Hartford, Conn.

DATE 19
SHIP VIA Pick Up
JOB NO. A 7311

PLEASE ENTER OUR ORDER FOR THE FOLLOWING –

QUANTITY	ARTICLES AND DESCRIPTION	PRICE	
8	Spark plugs		
1	Set of points		
1	Condenser		
1	Muffler.		
	Total Bill		

BY
Purchasing Agent

THE A. C. HINE COMPANY
189 WASHINGTON STREET
HARTFORD, CONN. 06106

PURCHASE ORDER
Nº 6352
THE ABOVE NUMBER SHOULD APPEAR ON YOUR INVOICE

TO Roger's Service Station
STREET 678 Silas Deane Hiway
CITY Cromwell, Conn.

DATE 19
SHIP VIA Truck
JOB NO. A 7312

PLEASE ENTER OUR ORDER FOR THE FOLLOWING:–

QUANTITY	ARTICLES AND DESCRIPTION	PRICE	
2	Starters		
2	Batteries		
2	Generators		
2	Coils		
2	Distributors		
	Total Bill		

BY
Purchasing Agent

THE A. C. HINE COMPANY
189 WASHINGTON STREET
HARTFORD, CONN. 06106

PURCHASE ORDER
№ 6352
THE ABOVE NUMBER SHOULD APPEAR ON YOUR INVOICE

TO Mr. John Foster
STREET 16 Amherst St.
CITY Wethersfield, Conn.

DATE 19
SHIP VIA Pick Up
JOB NO. A 7313

PLEASE ENTER OUR ORDER FOR THE FOLLOWING —

QUANTITY	ARTICLES AND DESCRIPTION	PRICE
1	Muffler	
1	Tail pipe	
1	Exhaust pipe	
1	Set of points	
1	Coil	
	Total Bill	

BY
Purchasing Agent

THE A. C. HINE COMPANY
189 WASHINGTON STREET
HARTFORD, CONN. 06106

PURCHASE ORDER
№ 6351
THE ABOVE NUMBER SHOULD APPEAR ON YOUR INVOICE

TO Gridley's Garage
STREET 400 Maple Ave.
CITY Bloomfield, Conn.

DATE 19
SHIP VIA Pick up
JOB NO. A 7314

PLEASE ENTER OUR ORDER FOR THE FOLLOWING —

QUANTITY	ARTICLES AND DESCRIPTION	PRICE
24	Sparkplugs	
1	Generator	
1	Tail pipe	
1	Distributor	
2	Condensers	
2	Coils	
	Total Bill	

BY

Using the following wholesale prices, complete the following invoices:

Description	Retail Price	Wholesale Price
Set of brake lining, No. 4	$ 87.75	$35.10
Set of brake lining, No. 3	24.40	14.64
Rear drum	105.74	95.17
Leaf	16.28	14.21
Pin	2.00	1.50
U Bolt	3.00	1.50
Bushing	2.10	1.57
Center bolt	.80	.60
Clip bolt	.60	.45
Drag link	8.10	6.89
Castor shim	1.60	1.36

Superior Spring & Manufacturing Co., Inc.
AUTOMOBILE SPRINGS

397 WASHINGTON STREET
Hartford, Conn.

REPAIRING
ALTERING
RESETTING

SPRINGS
BOLTS
BUSHINGS

NEW HAVEN BRANCH: – 90 GOFFE ST.

THIS IS YOUR ONLY INVOICE

Customer's Order No. X Phone No. 529-5300 Date 19

Sold To John Foster

Address 4047 Franklin Ave

City Hartford, Conn.

SOLD BY	CASH	C. O. D.	CHARGE	ON ACCT.	MDSE. RETD.	PAID OUT	
J.P.			✓				

QUAN.	DESCRIPTION	PRICE	AMOUNT
1	Set No 3 brake lining		
1	Set No4 " "		
2	Rear drums		
	Turn 2 front drums, Labor	—	9 00
	Labor for drums, Labor	—	8 00
	Sales Tax		
THANK YOU Please keep this copy for reference.		TOTAL	

173

Superior Spring & Manufacturing Co., Inc.
AUTOMOBILE SPRINGS

REPAIRING
ALTERING
RESETTING

397 WASHINGTON STREET
Hartford, Conn.

SPRINGS
BOLTS
BUSHINGS

NEW HAVEN BRANCH: – 90 GOFFE ST.

THIS IS YOUR ONLY INVOICE

Customer's Order No. D 903 Phone No. CH62697 Date 19

Sold To Peachy's Garage

Address 646 Nott St.

City Wethersfield, Conn

SOLD BY	CASH	C. O. D.	CHARGE	ON ACCT.	MDSE. RETD.	PAID OUT	
S.G.				✓			

QUAN.	DESCRIPTION	PRICE	AMOUNT	
1	Leaf			
2	Pins			
1	U bolt			
1	Bushing			
1	Center bolt			
2	Clip bolts			
1	Assembly (not labor)	—	2	00
	Labor		11	00
	Sales Tax			
THANK YOU Please keep this copy for reference.		TOTAL		

Superior Spring & Manufacturing Co., Inc.
AUTOMOBILE SPRINGS

397 WASHINGTON STREET
Hartford, Conn.

REPAIRING
ALTERING
RESETTING

SPRINGS
BOLTS
BUSHINGS

NEW HAVEN BRANCH: – 90 GOFFE ST.

THIS IS YOUR ONLY INVOICE

Customer's Order No. M 013 Phone No. FM 61000 Date 19

Sold To Billy's Service Station

Address 4007 Roosevelt St.

City Hartford, Conn.

SOLD BY	CASH	C. O. D.	CHARGE	ON ACCT.	MDSE. RETD.	PAID OUT	
	✓						

QUAN.	DESCRIPTION	PRICE	AMOUNT	
1	Drag link			
1	Castor shim			
	Labor	—	3	00
	Alignment, labor	—	12	00
	Balancing, labor	—	5	00
	Sales Tax			
	THANK YOU Please keep this copy for reference.	TOTAL		

7-3 Extended Payment

Bills are usually payable in full within 30 days of the billing date. The billing date is the date the bill was made out by the seller. If a bill is not paid within 30 days, a carrying charge is added to the total amount due. Usually the carrying charge is 1½% of the total due.

Example 1: Find the carrying charge on a bill not paid in the 30 day period that carried a 1½% service charge. The total due was $37.65.

Solution:

Multiply .015 x 37.65

Service charge is $ .56

(See tape, right)

```
           T
 3 7.6 5 x <
     .01 5 =
 .5 6 4 7 5 T
```

The new net amount now due will be the original net due plus the carrying charge. In our example above this would be $37.65 + .56 or $38.21 now due.

Carrying charges, or penalties, are often charged by cities and towns for taxes not paid in a specified time and also by the Water Bureau for late payment of water bills.

7-3 EXERCISES: Complete the following table. Assume the net amounts have not been paid in 30 days.

	Net Amount Due	1½% Carrying Charge	New Net Due
1.	$ 33.50		
2.	$ 5.20		
3.	$ 362.50		
4.	$8265.70		
5.	$ 79.65		
6.	$ 129.35		
7.	$ 26.98		

	Net Amount Due	1½% Carrying Charge	New Net Due
8.	$4567.89		
9.	$ 7.62		
10.	$ 765.43		

Solve the following problems:

11. If a customer has a bill of $37.50 and has not paid it within 30 days, what amount must he pay? Answer: $______

12. A customer has a bill of $84.32 at the beginning of a 30 day period and pays the store $20.00 of this amount. He does not pay the rest of the bill within the 30 days. How much must he pay after the 30 day period is over?

13. A customer's bill is $109.76 and he pays $25.00 within the 30 days allowed him. He then purchases additional merchandise amounting to $55.75. What is the total amount of his next month's statement (bill)?

14. Assume the following has been paid within 10 days and carries a 5% discount. Including sales tax, find the total amount due. (See next page.)

INVOICE

No. 2696

EDWARD W. MACK & SON
Manufacturers — Distributors
Established in 1832
55 MACK STREET WINDSOR, CONN.
TEL: Mu 8-3735

DATE 7/19

SOLD TO
Anderson-Fairoaks
Hartford, Conn.

SHIPPED TO
Windsor Town Hall
Windsor

OUR ORDER NO.	YOUR ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	PPD. OR COLL.
2696	7259	E.M.	10 da. - 5%	Roger Sherman	—

QUANTITY	DESCRIPTION	PRICE	AMOUNT
700,000	Harvard Waterstruck Brick	83.50/1000	
10,000	Random used Brick	64.25/1000	

ORIGINAL

7-4 Industrial Buying - Discounts

Many wholesalers and manufacturers offer their goods to the retailer at a price called the list price. List price is the cost of an item as it is listed in a catalogue. List prices remain the same for long periods of time, other wise, the wholesaler or manufacturer would spend large sums of money continually revising his catalogues.

In order to account for changes in the market, changes in production costs, and various other factors that influence the price of an item, discounts or deductions are allowed from list prices. Discount is the amount that an item is reduced in price by the wholesaler or manufacturer. Discounts are usually given as per cents. Often discounts are so large that the list price gives no idea of the actual cost.

Net price indicates the cost of an item after a discount has been taken off the list price. That is,

Net price = List price - Discount.

Example 1: Find the net price for the following:

Item	List Price	% Discount	Net Price
Electric Drill	$31.00	40%	?

Solution:

List Price = $31.00
% of Discount = .40 Multiply
Discount = $12.40

List Price = $31.00
Discount = 12.40 Subtract
Net Price = $18.60 Answer

Note: First, find the amount of the discount by multiplying the list price by the rate of discount. Second, subtract the discount from the list price to find the net price.

7-4 EXERCISES: Complete the following:

	List Price	% of Discount	Discount	Net Price
1.	$ 2.90	40		
2.	$ 362.50	33		
3.	$2567.25	5		
4.	$ 89.98	17		
5.	$ 79.50	33 $\frac{1}{3}$		
6.	$ 1.59	43		
7.	$ 786.92	3½		
8.	$6256.00	25		
9.	$3003.03	31		
10.	$ 9.99	12		
11.	$ .65	18		
12.	$ 929.33	5		

7-5 Successive Discounts

Industrial list prices often carry more than one discount. There may be a trade discount allowed only to a dealer in the trade. There may be a quantity discount granted to those that buy in large amounts. When there is more than one discount, we call them successive discounts. They may be expressed as "less 20%, less 10%, less 5%," "20, 10, and 5," or simple "20-10-5".

When more than one discount is given, each net price must be found separately. The order in which you do this does not affect the final result.

Let us do the following example to illustrate the method used.

Example 1: Find the net price on a set of tools that lists for $43.25 and carries discounts of 20-10-5.

Solution:

List price :	$43.25	List Price:	$43.25
% of Discount:	.20	First Discount:	_____
First Discount:		First Net Price:	

Your first net price should be $34.60.

First Net Price:	$34.60	First Net Price:	$34.60
Second % Discount:	.10	Second Discount:	_____
Second Discount:		Second Net Price:	

Your second net price should be $31.14.

Second Net Price:	$31.14	Second Net Price:	$31.14
Third % Discount:	.05	Third Discount:	______
Third Discount:		Final Net Price:	

Your final net price should be $29.58.

At first glance you might be led to say that a discount of 20-10-5 is 20 + 10 + 5 or a 35% discount. This is not true!

Let us take the example we have just completed and do it this way. That is,

Example 2: Find the net price on an item listing at $43.25 carrying a 35% discount.

Solution:

List Price:	$43.25	List Price:	$43.25
% of Discount:	.35	Discount:	______
Discount:		Net Price:	

Your net price should be $28.11.

Now compare this answer, $28.11, with the answer to Example 1 of $29.58. Do you see that successive discounts of 20-10-5-% give a different net price than a single discount of 35%?

So if you see successive discounts in a problem, do not add them. Find each net price individually until you reach the final net price. That is, the first discount is based on the list price; the second on the remainder after deducting the first discount; the third, on the remainder after deducting the first two discounts; and so on.

7-5 EXERCISES A:

1. The list price for an adjustable wrench is $26.10 with successive discounts of 25% and 5%. Find the net price of the wrench. (Caution: Do not add the 25% and 5%!)

2. Lumberjack Stores give a "cash and carry" discount of 15% and 4%. This means that if you pay cash for an item and bring it home yourself you are given these discounts. What is the "cash and carry" price of a rotary lawnmower that lists at $69.75?

3. The list price of a box of bolts (100 bolts per box) is $14.65. The discount is 33-10-5. Find the net price of a box of bolts.

SUCCESSIVE DISCOUNTS 7-5 EXERCISES B:

	LIST PRICE	FIRST % DISCOUNT	FIRST DISCOUNT	FIRST NET PRICE	SECOND % DISCOUNT	SECOND DISCOUNT	FINAL NET PRICE
1.	$ 36.85	5%			2%		
2.	$ 115.94	2½%			1%		
3.	$ 83.90	3%			1½%		
4.	$4380.65	7½%			5%		
5.	$ 245.85	10%			6¼%		
6.	$ 32.90	5%			1½%		
7.	$ 115.36	9%			12%		
8.	$ 250.45	7%			10%		
9.	$1450.29	10%			15%		
10.	$ 340.28	8%			3½%		
11.	$ 76.85	35%			2½%		
12.	$ 118.46	20%			3%		
13.	$ 46.90	17%			5%		
14.	$ 228.80	15%			3½%		
15.	$ 88.35	18%			5%		
16.	$ 420.50	16%			4%		
17.	$1134.80	30%			4½%		
18.	$ 89.20	40%			12%		
19.	$ 660.75	25%			7%		
20.	$ 345.15	18%			2%		

21. The list price of a pair of cutting shears is $8.79. Find the net price of the item if the discount is 15-25.

22. Find the net price for the following items.

STEEL IN ALL ITS FORMS
INDUSTRIAL & CONTRACTORS SUPPLIES

L. L. ENSWORTH & SON, INC.

270 LOCUST STREET, HARTFORD, CONNECTICUT
TELEPHONE 525-9141

Customer's Order No. 68412:

Bright Electric Contractor Co.

Two ½" Black & Decker Electric Drills (#575)

Catalogue:

List Price is $91.04 each

Discount is 35-5.

23. Many businesses grant their employees an additional discount on a limited number of items. This discount is often in addition to various discounts available to all customers. Assume that an employee is granted a 15% discount on the following items. Find the cost of each to him.

Item	List Price	Regular Discounts	Net to Employee
Washing Machine	$229.95	20%	
Vacuum Cleaner	$ 79.50	25%	
Fan, 20"	$ 23.50	15%	
Electric Range	$279.45	14%	
Portable T.V.	$119.95	12%	

7-6 Using Complements

There is a way of discounting in one step. Let us look at an example to illustrate this method.

Example 1: The list price of a drill is $87.50. Find the net price with a discount of 12%.

Solution:

Old Method

List Price	$87.50
% of discount	.12
Discount	10.50

List Price	$87.50
Discount	10.50
Net Price	$77.00

Complement Method

100% - 12% = 88%.

List Price	87.50	
Complement of Discount	.88	Multiply
Net Price	$77.00	

Notice the same result in each case!

Notice that the net price is the same using either method.

The complement of a discount is found by subtracting the per cent of discount from 100%.

Complement = 100% - per cent of discount

When more than one discount is being applied we can also make use of complements.

Example 2: List price $82.00

Discounts 30-20-10. Find the net price.

Solution:

a) Find the complement of each discount

100% - 30% = 70%

100% - 20% = 80%

100% - 10% = 90%

b) Multiply these by the list price.

82 (.70) (.80) (.90)

c) The product is your net price.

Namely, $41.33.

(Remember to use your TR key in finding this product containing a series of factors. See tape.)

```
                  T

          8 2 x <
           .7 0   =
        5 7.4 0 x T

           .8 0   =
    4 5.9 2 0 0 x T

           .9 0   =
  4 1.3 2 8 0 0 0 T
```

To find the net price, multiply the list price by the product of the complements of the discounts expressed as decimals.

7-6 Exercises: Use the complement to find the net price in each of the following.

List Price	% of Discounts	Complements	Net Price
1. $ 5.20	10	(.90)	
2. $ 340.00	40	( )	
3. $ 11.45	15-4	( )( )	
4. $ 202.02	33-10-5	( )( )( )	
5. $ 3.29	33 $\frac{1}{3}$-3½-2	( )( )( )	
6. $2560.70	40-10-15	( )( )( )	
7. $ 89.95	12-12-7	( )( )( )	
8. $5367	30-25-2½	( )( )( )	
9. $ 736.79	30-17-6-2	( )( )( )( )	
10. $ 29.95	17-3½-2	( )( )( )	

7-7 Discounts - Applications

After the net price has been determined, other factors influence the final bill. You have already worked with two of these; sales tax and 2% discount for bills paid in 10 days.

7-7 EXERCISES: Find the final net prices for each of the following. In each case the 3½% sales tax is to be added and a 2% discount for paying in 10 days is to be deducted.

List Price	% of Discounts	Sub-Total	Tax	Sub-Total	2% Discount	Net
1. $ 29.95	10-5					
2. $ 397.00	30-10-20					
3. $7292.60	15-10-5					
4. $ 9.98	40-10-12					

G. FOX & CO. INC.
Hartford • 15 • Connecticut • CHapel 9-9711
Serving Connecticut since 1847

G. Fox & Co., Inc. is buying the following merchandise from a wholesaler. If G. Fox pays for the merchandise within 10 days it can deduct 2% from the bill. This information is usually given as: 2/10 da. In this problem, assume that G. Fox has paid within the discount date of 10 days. Find the amount that must be paid.

5.

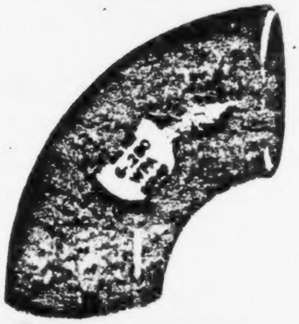
Quantity	Description	Price	Total
10 doz.	Nylon sweater, long sleeve, pull-over, color XB93411	$12.75 per doz.	
8 doz.	Skirts, MC03417	4.75 ea.	
15	Handbags, GS49978	18.75 per doz.	
18 doz.	Handkerchiefs, FM60032	3.24 per doz.	
10 doz.	Towels, TX06614	24.00 per doz.	
7 doz.	Sheets, SG61192	.85 ea.	______
			$

6. G. Fox buys $879.52 worth of merchandise from a wholesaler. A normal discount of 12% is applied to this amount. The store pays the bill within 10 days of billing and is entitled to a 3% discount. What is the final amount to be paid?

You will need the following information, taken from a pricing catalogue, to do the problems on the next page.

90° ELBOWS

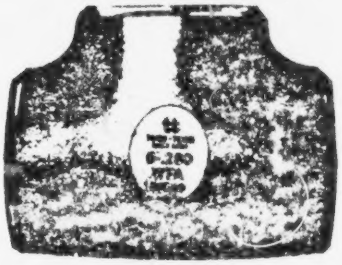
Standard Weight†



NOMINAL PIPE SIZE	LIST PRICE
½	$ 1.00
¾	1.00
1	1.20
1¼	1.40
1½	1.70
2	2.10
2½	3.40
3	4.90
3½	6.35
4	7.65
5	10.85
6	15.80
8	30.00
10	53.40

STRAIGHT TEES

Standard Weight†



NOMINAL PIPE SIZE	LIST PRICE
½	$ 2.15
¾	2.15
1	2.15
1¼	2.90
1½	3.65
2	5.00
2½	7.30
3	9.50
3½	12.50
4	13.00
5	24.00
6	28.00
8	45.00
10	76.00

Nominal pipe sizes are in inches.

7. Using the list prices on the preceding page, determine the customer's bill if he is entitled to the following discounts:

Item:	Discount:
90 Elbows	45%
Straight Tees	35%

Customer's Order:

Quantity:	Description:	List Price:	Discount:	Net Price:
24	1", 90 Elbows	$	$	$
72	2", " "			
48	4", " "			
12	6", " "			
10	1", Straight Tees			
22	2", " "			
16	4", " "			
4	6", " "			

Net Price ....$

3½% Sales Tax ....$______

Total ...$

Less 2% discount if paid within ten days ....$______

Final bill to customer ....$

8. Find the total amount due in the following carrying discounts of 10-5-5. Make sure you add the 3½% sales tax. Notice that prices are quoted per 1000 brick.

INVOICE

No. 2696

EDWARD W. MACK & SON

Manufacturers — Distributors
Established in 1832
55 MACK STREET WINDSOR, CONN.
TEL: Mu 8-3735

DATE 9/10

SOLD TO
Geo. Fuller Cons.
Berlin, Conn.

SHIPPED TO
State of Conn.
Wethersfield, Conn.

OUR ORDER NO.	YOUR ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	PPD. OR COLL.
7251	987	em	10-5-5	Buyer	✓

QUANTITY	DESCRIPTION	PRICE	AMOUNT
100,000	Harvard water struck brick	$87.75/1000	
5,000	Colonial face	93.00/1000	

DUPLICATE

7-8 Freight Rates

Another factor that must be considered in industrial buying are charges for shipping items, often referred to as freight rates. They may be given as $ .0165 per lb., 17¢ per 100 lbs., or even $1.59 per 1000 lbs.

Freight rates are not taxable. They must be added after the sales tax has been computed.

Example 1: Find the final net price on a shipment weighing 814 lbs., listing at $1214.44 with a discount of 35%. The freight rate is $ .0165 per lb. and the sales tax is 3½%.

Solution:

List Price	$1214.55
Less Discount	425.09
Net Price, Sub-Total	789.46
3½% Sales Tax	27.63
Net Price, Sub-Total	817.09

Freight charge: $.0165 per lb. x 814 lb. = 13.43

Final Net Price = $830.52

Now, try these.

7-8 EXERCISES: Find the following freight charges:

Number of lbs. x Rate per lb. = Freight Charge

1.	1296	$.0163	
2.	356	1.3¢	
3.	2652	$.0152	
4.	762	1.72¢	

Find the final net price in each of the following. Include the 3½% sales tax in each case.

5. List Price = $72.56
Discounts = 35%-5%
Weight = 37 lb. Freight Rate = .0167 per lb.

6. List Price = $2563.75
Discounts = 26-12-6
Weight = 712 lbs. Freight Rate = 1.55¢ per lb.

7. List Price = $316.55
Discounts = 40-25-15
Weight = 3343 lbs. Freight Rate = $.0132 per lb.

8. List Price = $7296.37
Discounts = 33-12-4
Weight = 8376 lbs. Freight Rate = $.113 per 100 lbs.

9. You are employed by Capitol Light & Supply Co., Hartford, Conn. as an order clerk. Capitol Light is buying some stock items from a manufacturer. Your job is to figure the total bill for the purchase of these items. This bill is the cost of the items to Capitol Light.

Here is the problem:

You are directed to purchase the following items from A B C Electric Manufacturers Inc. for Capitol Light & Supply Co.

Purchase Order Information:

Number of Items to Order:	Catalogue Number:
80	100A
40	110C
200	170F
17	185H
200	190I
250	200J

Catalogue Information:

Catalogue Number:	Weight per Item:	List Price per Item:
100A	1.50 lb.	$1.10
110C	1.20 "	.90
170F	1.00 "	.75
185H	8.00"	9.60
190I	1.30 "	.60
200J	1.80 "	1.35

(1)	(2)	(3)	(4)	(5)	(6)
Catalogue Number	Number Of Items	Weight Per Item	List Price Per Item	Total List Price (2) x (4)	Total Weight (2)x(3)
100A					
110C					
170F					
185H					
190I					
200J					
				$ ______	______ Lb.

The total List Price is ....\$________

Less discount of 45% ....\$________

Net Price, Sub-Total ....\$________

In addition, Capitol Light has to pay for the cost of the shipment of the items by railroad or truck. The freight cost is \$.0165 per pound of Total Weight.

Freight Charge is \$______per lb. x ________lb. = \$________

(Answer): Net Cost to Capitol Light = \$________

7-9 Combination Problems

In this section we will work on problems involving all the ideas we have learned in this chapter to this point.

7-9 EXERCISES: Practical Problems in Buying

You are working for an industrial hardware company and you have to find the net price of various orders that customers send in. Assume that the state sales tax is 3½%. Do not forget to add the sales tax in to your final net price.

1. A customer orders 2400 ft. of ½" rope. Tell the customer how much the rope will cost him (include the sales tax.)

From your price catalogue, you find that ½" rope weighs 8 pounds per 100 ft. and the list price is 70¢ per pound. The discount is 12%.

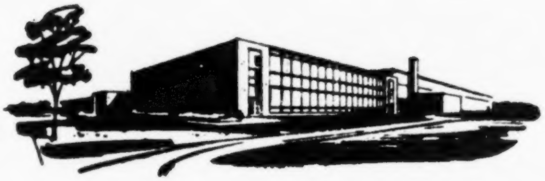
2. A customer orders 800 ft. of steel chain. Find how much he has to pay. From the price catalogue you find that chain weighs 2¼ pounds per 100 ft. The list price is $2.38 per pound. The discount is "less 5 and 5" (5-5)

3. You are finding the price of 2000 sheets of sandpaper. From the catalogue you find that the list price is $8.50 per 100 sheets. The discount is 12-40.

4. You are finding the price of 550, 3/8" x 1" machine bolts. From your price catalogue you find that the list price is $11.50 per 100 bolts. The discount is 28-10-5.

5. You are finding the price of a circular sanding belt. The circumference is 80 inches. From your price catalogue you find that the list price is $.018 per inch of circumference. Add a charge of $.32 for making the belts into a circle. (This is a labor charge). Discount is 12-12-5.

6.



STEEL IN ALL ITS FORMS
INDUSTRIAL & CONTRACTORS SUPPLIES

L. L. ENSWORTH & SON, INC.

270 LOCUST STREET, HARTFORD, CONNECTICUT
TELEPHONE 525-9141

Customer's Order No. 66-795:

The Park Department of the City of Hartford wants to purchase 1 coil (1200 feet) of ½ manila rope.

Catalogue:

List Price is 30¢ per lb.

Weight is 7.35 lb. per 100 ft.

Discount is 15%.

Sales tax is 3½%.

7. Plumbing and Heating Materials.

SUCCESSIVE DISCOUNTS:

Find the net amount of this invoice.

State sales tax is 3½%.

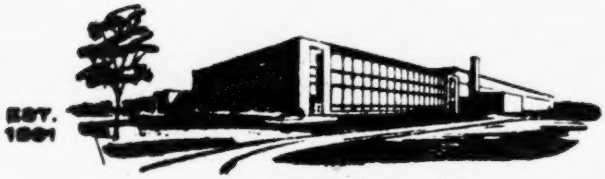
Discounts are as indicated.

Quantity	Description	List Price	Extension
100	¼" Cast Iron Elbows	$.23 each	$
175	½" "	.26 "	
100	3/4" "	.29 "	
100	1" "	.32"	
150	1 ¼" "	.39 "	________
		List Price	$

Less discount of 76-10-10-10-10
(Use complement method or successive discounts)

Net Amount	$
Sales Tax	$________
Total Bill	$________

3. Find the net amount in the following:



STEEL IN ALL ITS FORMS
INDUSTRIAL & CONTRACTORS SUPPLIES

L. L. ENSWORTH & SON, IN

270 LOCUST STREET, HARTFORD, CONNECTICUT

Customer's Order No. A 4343:

The J & J Construction Co.

250 pcs. ½" Diameter x 3" long hex head Machine Bolts

250 pcs. ½" lock washers.

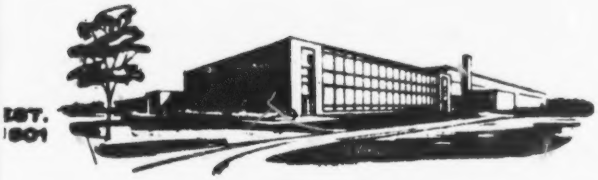
250 pcs. ½" flat washers.

Catalogue:	List Price:	Discount:
½" x 3" machine bolts	$12.70 per 100	33-10-5
½" lock washers	$10.40 per 1000	29-10
½" flat washers	$ 5.52 per 1000	35-25

Sales tax; 3½%

Assume bill is paid within 10 days, and discount is 2%.

9. Add 3½% sales tax in computing the net amount in the following.



STEEL IN ALL ITS FORMS
INDUSTRIAL & CONTRACTORS SUPPLIES

L. L. ENSWORTH & SON, INC

270 LOCUST STREET, HARTFORD, CONNECTICUT

Customer's Order No. 77432:

The F. L. Roberts Cabinet Makers Co.

1500 sheets of 80 grit of 9" x 10" sandpaper.

Catalogue:

List price is $10.40 per 100 sheets

One unit (or one box) = 500 sheets

Base discount is 12% (Regardless of number of units purchased)

Another discount is subtracted if the customer buys:

One Unit 10%

Two Units 24%

Three Units...35%

Four Units ...40%

10. Successive Discounts:

Mr. Crane decided to install air conditioning, refrigerators, and stoves in the 3 duplex homes he was building. He will be buying 6- 6,000 BTU Air Conditioners at $295.00 per unit; 6 Frigidaire refrigerators at $470.00 each; and 6 electric ranges at $185.00 each. Complete the following bill; finding the totals of each item and then the grand total. If the discount to Mr. Crane is 15%-30%-5%, payable in 30 days, what amount should Griffing T. V. expect to receive? Sales tax is 3½%.

STATEMENT

GRIFFING T.V., INC.

238 Bloomfield Ave. Windsor, Conn. 06095

Windsor
688-6271

Windsor Locks
623-7243

Date ______________________

____

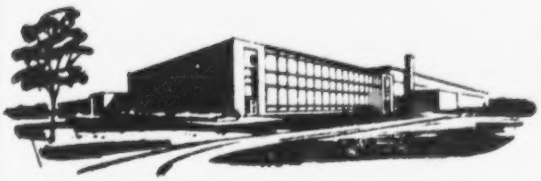
____

____

DATE	DESCRIPTION	CHARGES	CREDITS	BALANCE

ANY CHARGES OR PAYMENTS MADE AFTER THE 25TH OF THE MONTH WILL APPEAR ON THE NEXT STATEMENT.

11. Complete the following:



STEEL IN ALL ITS FORMS

INDUSTRIAL & CONTRACTORS SUPPLIES

L. L. ENSWORTH & SON, INC.

270 LOCUST STREET, HARTFORD, CONNECTICUT

Customer Order No. G490035

Parker & Fenton Contracting Co.

Quantity	Item	List Price	Total List Price	Discount	Net Price
1	10 lb. sledge hammer	$13.66 ea.		25-10	
3	8" screw drivers	$ 3.96 ea.		22-12	
5	6 ft. rules	$ 4.20 ea.		20-25	
4	18" adjustable wrenches	$26.10 ea.		25-5	
12	5/8" box wrenches	$ 8.75 ea.		20-15	
2	3 ft. crow bars	$10.80 ea.		25-10	________

Sub-Total $

Sales Tax 3½% ________

Sub-Total ________

Less 2% Cash ________

Final Net Price ________

12. Complete the following:

Plumbing and Heating Materials

Quantity	Description	List Price	Extension	Discount	Net
12	½" Valve	$2.26 ea.		25%	
36	¾" "	3.75 ea.		25%	
1	1" "	5.35 ea.		25%	
12	½" Strainers	1.98 ea.		22-5%	
3	¾" "	2.76 ea.		22-5%	
12	1" "	3.59 ea.		22-5%	
2	½" Check Valve	1.95 ea.		15-10%	
2	¾" " "	2.98 ea.		15-10%	
4	1" " "	4.07 ea.		15-10%	
18	½" Trap	7.43 ea.		20-5%	
12	¾" "	9.55 ea.		20-5%	
15	1" "	12.09 ea.		20-5%	______

Total net amount ______

If this bill is paid in 10 days, deduct 2% ______

Final Net Bill ______

7-10 Finding the Per Cent of Discount

The amount of discount is sometimes known and a buyer would like to find what this would be as a per cent of discount on the list price.

To find the per cent of discount, divide the discount by the list price.

$$\text{Per cent of discount} = \frac{\text{Amount of discount}}{\text{List Price}}$$

If the list price and net price are given, the amount of discount is the difference between the two.

Amount of discount = List Price - Net Price

Example 1: The list price of an item is $2.00. The net price is $1.50. Find the per cent of discount.

Solution:

a) Amount of discount = $2.00 - 1.50 = $ .50

b) $\text{Per cent of discount} = \frac{.50}{2.00}$

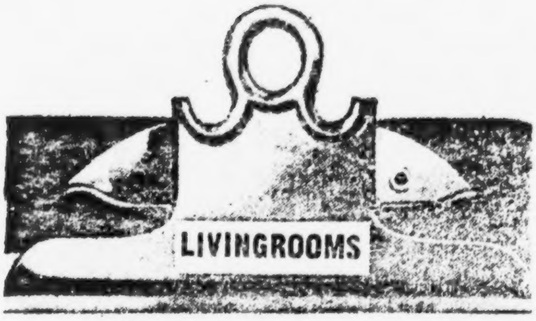
$= \frac{1}{4} = 25\%$ Answer

Carry the following out to the nearest hundredth of a percent.

7-10 EXERCISES: Find the per cent discount of the following items:

	Description	List Price	Net Price	Amount of Discount	% Discount
1.	Set of brake lining, No. 4	$87.75	$35.10		
2.	Set of brake lining, No. 3	24.40	14.64		
3.	Rear drum	105.74	95.17		
4.	Leaf	16.28	14.21		
5.	Pin	2.00	1.50		
6.	U Bolt	3.00	1.50		
7.	Bushing	2.10	1.57		
8.	Center bolt	.80	.60		
9.	Clip bolt	.60	.45		
10.	Drag link	1.60	1.36		

Find the per cent of discount on the following items.



INVENTORY STOCK CONTROL LIST

Per-Cent Discount

	DESCRIPTION: *Living Room*	Regular Price	SALE PRICE
11.	Solid Maple Sofabed	$159.00	**$ 49.00**
12.	Colonial Sofas & Chairs Tweeds and Prints	$239.00	**$137.00**
13.	3 Pc. Solid Maple Den Set	$199.00	**$119.00**
14.	Modern 3 Pc. Sectional Living Room	$359.00	**$199.00**
15	Colonial Sleeper with Full Mattress	$249.00	**$169.00**
16	Mediterranean Sofa and Chair	$550.00	**$329.00**
17.	100% Nylon Foam 3 Pc. Suite	$229.00	**$129.00**
18	2 Pc. King-size Colonial Living Room	$369.00	**$248.00**
19.	3 Pc. Colonial Sectional Living Room	$550.00	**$289.00**
20.	Plastic Foam Lounger	$ 54.00	**$ 29.00**
21.	Early American Print Sofa and Chair	$329.00	**$199.00**
22.	Odd Modern Upholstered Chairs	$ 79.00	**$ 19.00**
23	Deluxe 2 Pc. Colonial Living Room	$550.00	**$397.00**
24.	10 Pc. Living Room or Sofa Bed Set	$259.00	**$155.00**
25.	Solid Maple Sofabed	$159.00	**$ 99.00**
26.	3 Pc. Den Grouping	$239.00	**$168.00**
27.	Modern Hidebed— Decorator Fabric	$249.00	**$144.00**
28.	Sofa Beds, Choice of Fabric	$159.00	**$ 68.00**

7-11 Renting or Leasing Trucks

Suppose you had a license to drive a car, and you borrowed a friend's car to go on a trip. Your friend has already filled the gas tank himself. At the end of your trip, it would be proper for you to either pay him for "his" gas, or else, fill the tank yourself. Also, during the trip, the brakes were worn down a little, the tires lost some rubber, grease was used up for lubricating parts, engine parts wore down, etc. Again, it would only be fair for you to pay your friend something for depreciation of his car during your trip.

In a sense, you are renting your friend's car.

Suppose you are now a home owner. You have purchased a new home and want to move your furniture from your old home into the new one. You may decide to rent a truck to do this. If you did rent a truck, you would have to pay for the gas and also pay a "stand-by charge," which is another way of saying "depreciation." In addition, you would pay about 10¢ for every mile that you drove the truck. Trucks can be rented for many reasons.

Suppose you owned a fruit and vegetable company. It may not be profitable for you do buy your own trucks, so instead you rent them from a truck-rental company. A truck can be rented for one hour, one day, one week, a month, or a year.

Trucks may also be leased for periods of time that are greater than a year. Many companies lease trucks for as long as 7 or 8 years because it is more profitable for them to lease rather than to buy their own trucks.

Example: On the next page is an invoice for truck No. 103 being leased for a period of more than one year. The number at the top right-hand corner of the invoice is the invoice number (No. 3300).

Write the name and address of the company that is going to use this truck:

The mileage reading when the truck went out of the leasing company's yard was 7,500 miles.

The truck was then driven to deliver produce.

When the truck came back in, the reading was 16,500 miles. The total miles driven were 9,000. How was this determined?

Answer: ______

The rate for this truck is $ .18 for each mile that the truck is driven. How is the mileage charge of $1,620 determined?

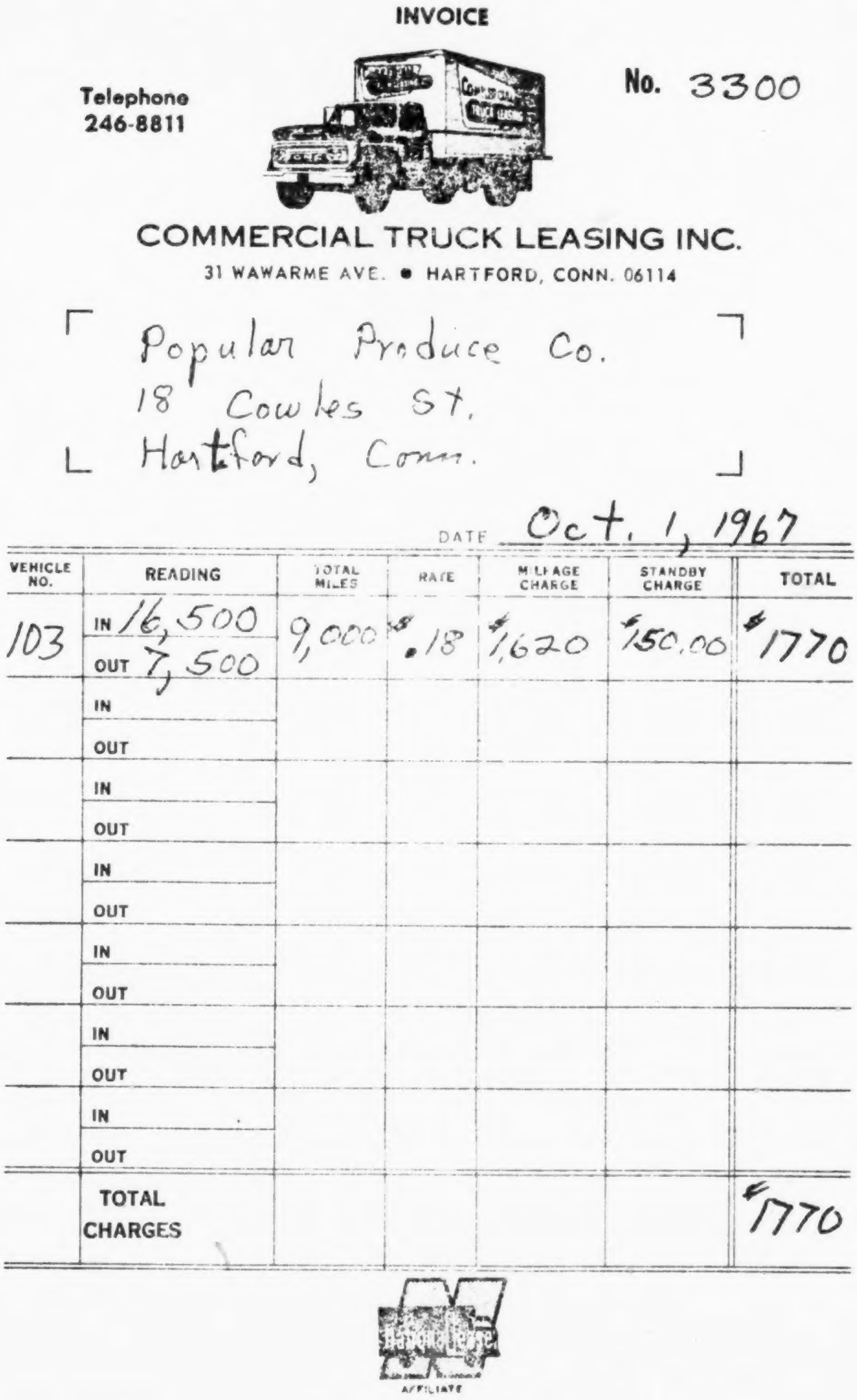
Answer: ______

The stand-by charge (or depreciation) is a fixed rate for this truck of $150.00. How is the total of $1770.00 determined?

Answer: ______

The total charges are printed at the bottom of the invoice. This is the bill that is sent to Popular Produce Co. for leasing the truck.

Example 1:



INVOICE

Telephone
246-8811

No. 3300

COMMERCIAL TRUCK LEASING INC.
31 WAWARME AVE. • HARTFORD, CONN. 06114

Popular Produce Co.
18 Cowles St.
Hartford, Conn.

DATE Oct. 1, 1967

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
103	IN 16,500	9,000	$.18	$1,620	$150.00	$1770
	OUT 7,500					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	TOTAL CHARGES					$1770

AFFILIATE

7-11 EXERCISES:

1. Determine the total charges to Piping Contractors, Inc. for leasing the following trucks. Notice that the charge for 150 gallons of gas must also be added in.

INVOICE

Telephone
246-8811

No. 3309

COMMERCIAL TRUCK LEASING INC.

31 WAWARME AVE. • HARTFORD, CONN. 06114

Piping Contractors, Inc.
30 Stone Rd.
East Hartford, Conn.

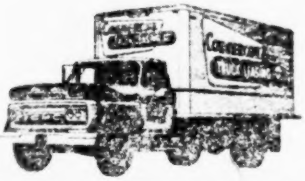
DATE: Nov. 23, 1967

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
102	IN 36,401		$.12		$95.00	
	OUT 19,803					
103	IN 27,343		.08		55.00	
	OUT 14,876					
104	IN 50,341		.055		30.00	
	OUT 39,608					
	IN					
	OUT	150 gallons of gas @ $.22				
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	TOTAL CHARGES					

nationaLease
AFFILIATE

2. Complete the following:

INVOICE



Telephone
246-8811

No. 3310

COMMERCIAL TRUCK LEASING INC.
31 WAWARME AVE. • HARTFORD, CONN. 06114

Johnson Electric Co.
549 Tanglewood Lane
Bolton, Conn.

DATE: Sept. 24, 1967

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
203	IN 138,491 OUT 137,024		$.055		$30.00	
206	IN 130,624 OUT 129,537		.103		78.00	
211	IN 72,637 OUT 70,901		.152		127.00	
223	IN 3,756 OUT 2,598		.180		155.00	
	IN OUT	200 gal. of gas @ $.22				
	IN OUT					
	IN OUT					
	TOTAL CHARGES					

3. Complete the following:

INVOICE

Telephone
246-8811

No. 3311

COMMERCIAL TRUCK LEASING INC.

31 WAWARME AVE. • HARTFORD, CONN. 06114

Mack Brick, Inc.
Mack St.
Windsor, Conn.

DATE: Jan. 2, 1967

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
673	IN 34,793		$.070		$45.00	
	OUT 34,607					
674	IN 67,109		.125		100.00	
	OUT 66,842					
681	IN 105,694		.103		78.00	
	OUT 105,077					
682	IN 83,072		.170		145.00	
	OUT 82,774					
683	IN 53,129		.135		110.00	
	OUT 52,177					
	IN					
	OUT	250 gal. of gas @			$.22	
	IN					
	OUT					
	TOTAL CHARGES					

NationaLease
AFFILIATE

4. Complete the following:

INVOICE

Telephone
246-8811

No. 3312

COMMERCIAL TRUCK LEASING INC.
31 WAWARME AVE. • HARTFORD, CONN. 06114

Charter Oak Oil Burner, Inc.
Wilson, Conn. 06095

DATE: July 14, 1967

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
22	IN 33,007		$.165		$140.00	
	OUT 28,039					
23	IN 67,903		.060		35.00	
	OUT 62,490					
24	IN 109,107		.111		86.00	
	OUT 105,079					
25	IN 28,451		.149		124.00	
	OUT 28,306					
26	IN 40,079		.105		80.00	
	OUT 39,097					
	IN					
	OUT	252 gal	@ $.22			
	IN					
	OUT					
	TOTAL CHARGES					

NationaLease
AFFILIATE

7-12 Truck Rental

This table is used for determining rental rates. These rates are only used for periods of less than one year.

HOURLY, DAILY, WEEKLY RENTAL RATES *

TYPE OF TRUCK	CARRYING CAPACITY (LBS.)	HOURLY RATE	DAILY RATE	WEEKLY RATE	MINIMUM CHARGE
HANDI-VAN	1,000 to 2,000	$1.65 plus 9¢ per mile	$ 9.00 plus 9¢ per mile	$ 40.00 plus 9¢ per mile	$ 7.00
9' PICKUP or RACK	3,000	$1.75 plus 10¢ per mile	$10.00 plus 10¢ per mile	$ 45.00 plus 10¢ per mile	$ 8.00
10' PACKAGE DELIVERY	2,000	$1.85 plus 11¢ per mile	$11.00 plus 11¢ per mile	$ 50.00 plus 11¢ per mile	$ 9.00
12' PACKAGE DELIVERY	4,000	$2.00 plus 12¢ per mile	$12.00 plus 12¢ per mile	$ 54.00 plus 12¢ per mile	$10.00
12' RACK or CLOSED VAN	8,000	$2.25 plus 13¢ per mile	$13.00 plus 13¢ per mile	$ 59.00 plus 13¢ per mile	$10.00
14' RACK or CLOSED VAN	9,000	$2.50 plus 15¢ per mile	$15.00 plus 15¢ per mile	$ 68.00 plus 15¢ per mile	$11.00
16' RACK or CLOSED VAN	10,000	$2.75 plus 16¢ per mile	$16.00 plus 16¢ per mile	$ 72.00 plus 16¢ per mile	$12.00
18' CLOSED VAN	10,000	$2.85 plus 17¢ per mile	$17.00 plus 17¢ per mile	$ 77.00 plus 17¢ per mile	$13.00
20' CLOSED VAN	10,000	$3.00 plus 17¢ per mile	$18.00 plus 17¢ per mile	$ 81.00 plus 17¢ per mile	$14.00
12' REFRIGERATED VAN	8,000	$3.00 plus 15¢ per mile	$18.00 plus 15¢ per mile	$ 81.00 plus 15¢ per mile	$14.00

HEAVY EQUIPMENT

16' RACK or CLOSED VAN	14,000	$3.00 plus 18¢ per mile	$18.00 plus 18¢ per mile	$ 81.00 plus 18¢ per mile	$14.00
16' RACK or CLOSED VAN	16,000	$3.25 plus 19¢ per mile	$20.00 plus 19¢ per mile	$ 90.00 plus 19¢ per mile	$15.00
16' RACK or CLOSED VAN	20,000	$3.50 plus 20¢ per mile	$22.00 plus 20¢ per mile	$ 95.00 plus 20¢ per mile	$16.00
TRACTOR—GAS	67,400 lbs. GCW	$4.00 plus 20¢ per mile	$24.00 plus 20¢ per mile	$100.00 plus 20¢ per mile	$18.00
TRACTOR—DIESEL	67,400 lbs. GCW	$4.50 plus 20¢ per mile	$29.00 plus 18¢ per mile	$120.00 plus 18¢ per mile	$20.00
TRAILER—PLATFORM	44,000	$2.00 plus 3¢ per mile	$12.00 plus 3¢ per mile	$ 50.00 plus 3¢ per mile	$ 8.00
TRAILER—VAN	44,000	$2.50 plus 3¢ per mile	$15.00 plus 3¢ per mile	$ 60.00 plus 3¢ per mile	$10.00

Power operated tail gate: $3.00 per day plus 1¢ per mile, or $12.00 per week, plus 1¢ per mile, added to the above rates.
Appliance hand trucks: $2.00 per day • Furniture pads: 35c each per day

Example 1: Truck Rental Problem

This problem refers to the rental invoice (3305) on the following page. An 18 ft. long closed van(Carrying capacity 10,000 lbs.) is to be rented for one day. Look at the Rental Rates table on page 212.

The Daily Rate is $17.00 plus 17 ¢ per mile.

Look at the invoice and see where this information is written.

The truck was used from 12:00 P. M. July 9 to 11:45 July 10.

Total Time is one day.

Total Miles is 200, found by subtracting ________ from ____________.

Charges:

200 miles at 17 ¢ per mile = $34.00.

One day at $17.00 per day = $17.00.

One hand truck was rented at $2.00 per day. This is listed at the bottom of the Rental Table.

Two blankets or furniture pads were rented at 35 ¢ per day. This is also listed at the bottom of the Rental Table.

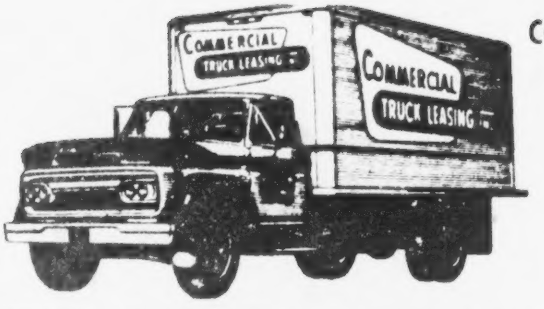
Collision insurance covering the first $100 worth of damage was taken out at a cost of $1.50.

Total Charges: = $55.20

Credits:

A deposit of $50 was paid before the truck was used.

Balance Due is therefore, $55.20 less $50.00, or $5.20.



COMMERCIAL TRUCK LEASING, INC.

31 WAWARME AVE.
HARTFORD, CONN. 06114
TEL. 246-8811

NEW BRITAIN BRANCH
1010 WEST MAIN ST.
TEL. 229-0309

INVOICE NO. 3305

NationaLea
NATIONAL TRUCK
SYSTEM AFFIL

LESSEE'S NAME Bradley Lumber Co., Inc.
STREET 646 South St.
CITY Hartford, Conn.

Vehicle Description
Rates from Table

VEHICLE NO.	187
SIZE	18' Closed V.
CAR CAPACITY LBS.	10,000
RATE PER day	$17.00
RATE PER MILE	17¢
INCLUDING FUEL	YES ☑ NO ☐
LIABILITY INSURANCE FURNISHE	LESSOR ☐ LESSEE ☑
FULL COLLISION COVERAGE	YES ☑ NO
TIME IN	11:45 AM. 7/.
TIME OUT	12.00 Noon 7.
TOTAL TIME	one da

MILEAGE IN	2	5	8	0
MILEAGE OUT	2	5	6	0
TOTAL MILES			2	0

CUSTOMER PURCHASE ORDER NO. 46

THE EQUIPMENT HEREIN DESCRIBED IS AUTHORIZED TO BE OPERATED IN THE FOLLOWING AREAS ONLY New England

AND FOR THE FOLLOWING PURPOSES ONLY Hauling Lumber

I WE WILL RETURN THE VEHICLE ON DATE 7/10/67 TIME 12 Noon

CONDITION OUT	O.K.	DAMAGE	CONDITION IN	O.K.	DAMAGE
CAB	✓		CAB	✓	
FENDERS	✓		FENDERS	✓	
GLASS	✓		GLASS	✓	
BODY	✓		BODY	✓	
CHECKED OUT BY	AR		CHECKED IN BY	AF	

WAS THERE AN ACCIDENT? YES ☐ NO ☑ INJURY TO ANY PERSON? YES ☐ NO ☐
DAMAGE TO OTHERS? YES ☐ NO ☑ DAMAGE TO THIS VEHICLE? YES ☐ NO ☑ SIGN A.R

REMARKS: LIST DRIVERS. SEE PARA. 9 ON PAGE 1

CHARGES

200 MILES @ 17¢	3
HOURS @ 1 DAYS @ 17.00 WEEKS @	1
1 HAND TRK. @ 2.00	
2 BLANKETS @ 35¢	
100 COLL. INS. @ 1.50	
FUEL @	—
TOTAL CHARGES	.5
DEPOSIT AMT.	.5
REFUND DUE AMT.	—
NET BALANCE DUE	

PAYMENT TERMS OPEN ACCOUNT FILE ☑ APPROVED BY

REFUND DUE CHECK ☐ CASH ☐ REC'D BY

OPEN ACCOUNT TERMS

THIS INVOICE DUE AND PAYABLE IN FULL WITHIN 7 DAYS OF INVOICE DATE. PAST DUE CHARGES WILL BEAR A SERVICE CHARGE OF ONE PERCENT PER MONTH.

PLEASE READ THIS RENTAL AGREEMENT

I/We hereby affirm that I/We have read the terms and conditions set forth on both Page 1 and Page 2 of this Truck Rental Agreement and I/We hereby accept delivery of the above described vehicle and/or property upon all of said terms and conditions.

LESSOR: COMMERCIAL TRUCK LEASING, INC.
By:
Date:

LESSEE:
By:
Lic. No. STATE NUMBER DATE

PAGE 2 247

DRIVER MUST BE 21 YEARS OF AGE OR OVER. SEE PARAGRAPH 9. ACCIDENTS MUST BE REPORTED AT ONCE! SEE PARAGRAPHS 13, 15, 16 AND 17.

PG 214

CUSTOMER'S C

7-12 [illegible] Complete the following rental agreements using [illegible] at the beginning of this section.

SEEN EVERYWHERE

COMMERCIAL TRUCK LEASING
COMMERCIAL TRUCK LEASING

TRUCK RENTAL AGREEMENT

COMMERCIAL TRUCK LEASING, INC. INVOICE NO.

31 WAWARME AVE.
HARTFORD, CONN. 06114
TEL. 246-8811

NEW BRITAIN BRANCH
1010 WEST MAIN ST.
TEL. 229-0309

NationaLease
NATIONAL TRUCK LEASING SYSTEM AFFILIATE

1.

VEHICLE NO. 103						
SIZE 20' Closed Van						
CAR CAPACITY LBS. 10,000						
RATE PER Week =						
RATE PER MILE						
INCLUDING FUEL YES ☑ NO ☐						
LIABILITY INSURANCE FURNISHED BY LESSOR ☑ LESSEE ☐						
FULL COLLISION COVERAGE YES ☑ NO ☐						
TIME IN 8:00 AM – 5/2						
TIME OUT 8:00 AM – 4/25						
TOTAL TIME						
MILEAGE IN	6	7	3	5	6	–
MILEAGE OUT	6	6	9	0	3	–
TOTAL MILES						

CHARGES

MILES @		
~~HOURS @~~ ~~DAYS @~~ WEEKS @		
1 HAND TRK. @		
BLANKETS @		
$100 COLL. INS. @ $1.50		
FUEL @		
TOTAL CHARGES		
DEPOSIT AMT.	350	00
REFUND DUE AMT.		
NET BALANCE DUE		

2.

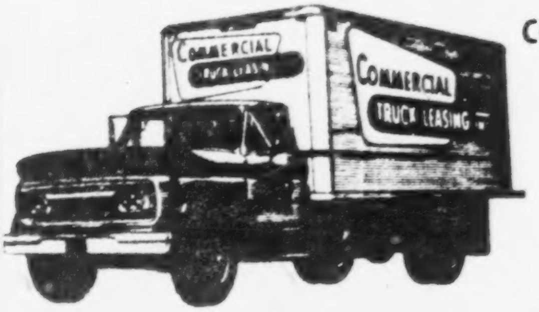
VEHICLE NO. 68						
SIZE Tractor – Gas						
CAR CAPACITY LBS 67,400 lbs.						
RATE PER Day =						
RATE PER MILE						
INCLUDING FUEL YES ☐ NO ☑						
LIABILITY INSURANCE FURNISHED BY LESSOR ☐ LESSEE ☑						
FULL COLLISION COVERAGE YES ☑ NO ☐						
TIME IN 4.30 P.M. 6/9/67						
TIME OUT 4.30 P.M. 6/2/67						
TOTAL TIME						
MILEAGE IN	3	5	6	5	4	–
MILEAGE OUT	3	3	9	7	5	
TOTAL MILES						

CHARGES

MILES @		
~~HOURS @~~ DAYS @ ~~WEEKS @~~		
HAND TRK. @		
BLANKETS @		
COLL. INS. @		
170 FUEL @ .22		
TOTAL CHARGES		
DEPOSIT AMT.	—	—
REFUND DUE AMT.		
NET BALANCE DUE		

215

SEEN EVERYWHERE



TRUCK RENTAL AGREEMENT

COMMERCIAL TRUCK LEASING, INC.

INVOICE NO.

31 WAWARME AVE.
HARTFORD, CONN. 06114
TEL. 246-8811

NEW BRITAIN BRANCH
1010 WEST MAIN ST.
TEL. 229-0309

NationaLease
NATIONAL TRUCK LEAS
SYSTEM AFFILIATE

3.

VEHICLE NO 403
SIZE Trailer Van
CAR. CAPACITY LBS 44,000 lbs.
RATE PER Week =
RATE PER MILE
INCLUDING FUEL YES ☑ NO ☐

LIABILITY INSURANCE FURNISHED BY
LESSOR ☐ LESSEE ☑
FULL COLLISION COVERAGE
YES ☑ NO ☐
TIME IN 4:30 P.M. 6/9/67
TIME OUT 4.30 P.M. 6/2/67
TOTAL TIME

MILEAGE IN	8	0	1	1	8	-
MILEAGE OUT	7	8	4	3	9	—
TOTAL MILES						

CHARGES

MILES @		
~~HOURS @~~ ~~DAYS @~~ WEEKS @		
HAND TRK. @		
BLANKETS @		
300 COLL. INS. @ 2.90		
FUEL @		
TOTAL CHARGES		
DEPOSIT AMT.	300	—
REFUND DUE AMT.		
NET BALANCE DUE		

4.

VEHICLE NO. 57
SIZE Handi-Van
CAR. CAPACITY LBS. 1000 - 2000 lb
RATE PER Hourly =
RATE PER MILE
INCLUDING FUEL YES ☑ NO ☐

LIABILITY INSURANCE FURNISHED BY
LESSOR ☑ LESSEE ☐
FULL COLLISION COVERAGE
YES ☑ NO ☐
TIME IN 5:00 P.M. 10/23/67
TIME OUT 8:00 A.M. 10/23/67
TOTAL TIME

MILEAGE IN	2	7	0	0	—	—
MILEAGE OUT	2	4	9	8	—	—
TOTAL MILES						

CHARGES

MILES @		
HOURS @ ~~DAYS @~~ ~~WEEKS @~~		
1 HAND TRK. @		
BLANKETS @		
COLL. INS. @		
FUEL @		
TOTAL CHARGES		
DEPOSIT AMT.	200	00
REFUND DUE AMT.		
NET BALANCE DUE		

SEEN EVERYWHERE

COMMERCIAL TRUCK

TRUCK RENTAL AGREEMENT

COMMERCIAL TRUCK LEASING, INC.

INVOICE NO.

31 WAWARME AVE.
HARTFORD, CONN. 06114
TEL. 246-8811

NEW BRITAIN BRANCH
1010 WEST MAIN ST.
TEL. 229-0309

NationaLease
NATIONAL TRUCK LEASIN
SYSTEM AFFILIATE

5.

VEHICLE NO. [illegible]43
SIZE 12' Refrigerated Van
CAR. CAPACITY LBS. 8,000
RATE PER [illegible]
RATE PER MILE
INCLUDING FUEL YES ☐ NO ☑

LIABILITY INSURANCE FURNISHED BY
LESSOR ☐ LESSEE ☑

FULL COLLISION COVERAGE
YES ☐ NO ☐

TIME IN [illegible] P.M. 9/20/67
TIME OUT [illegible] A.M. 9/14/67
TOTAL TIME

MILEAGE IN	0	3	7	2	6	—
MILEAGE OUT	0	2	5	6	7	—
TOTAL MILES						

CHARGES

MILES @		
HOURS @ DAYS @ WEEKS @		
HAND TRK. @		
BLANKETS @		
COLL. INS. @ [illegible]/50		
12 [illegible]		
TOTAL CHARGES		
DEPOSIT AMT.	50	00
REFUND DUE AMT.		
NET BALANCE DUE		

6

VEHICLE NO. 23
SIZE 10' Package Del.
CAR. CAPACITY LBS. 2,000
RATE PER Hour =
RATE PER MILE
INCLUDING FUEL YES ☐ NO ☑

LIABILITY INSURANCE FURNISHED BY
LESSOR ☑ LESSEE ☐

FULL COLLISION COVERAGE
YES ☑ NO ☐

TIME IN 8:00A.M. 7/11/67
TIME OUT 5:00P.M. 7/10/67
TOTAL TIME

MILEAGE IN	3	9	7	2	5	—
MILEAGE OUT	3	9	0	5	6	—
TOTAL MILES						

CHARGES

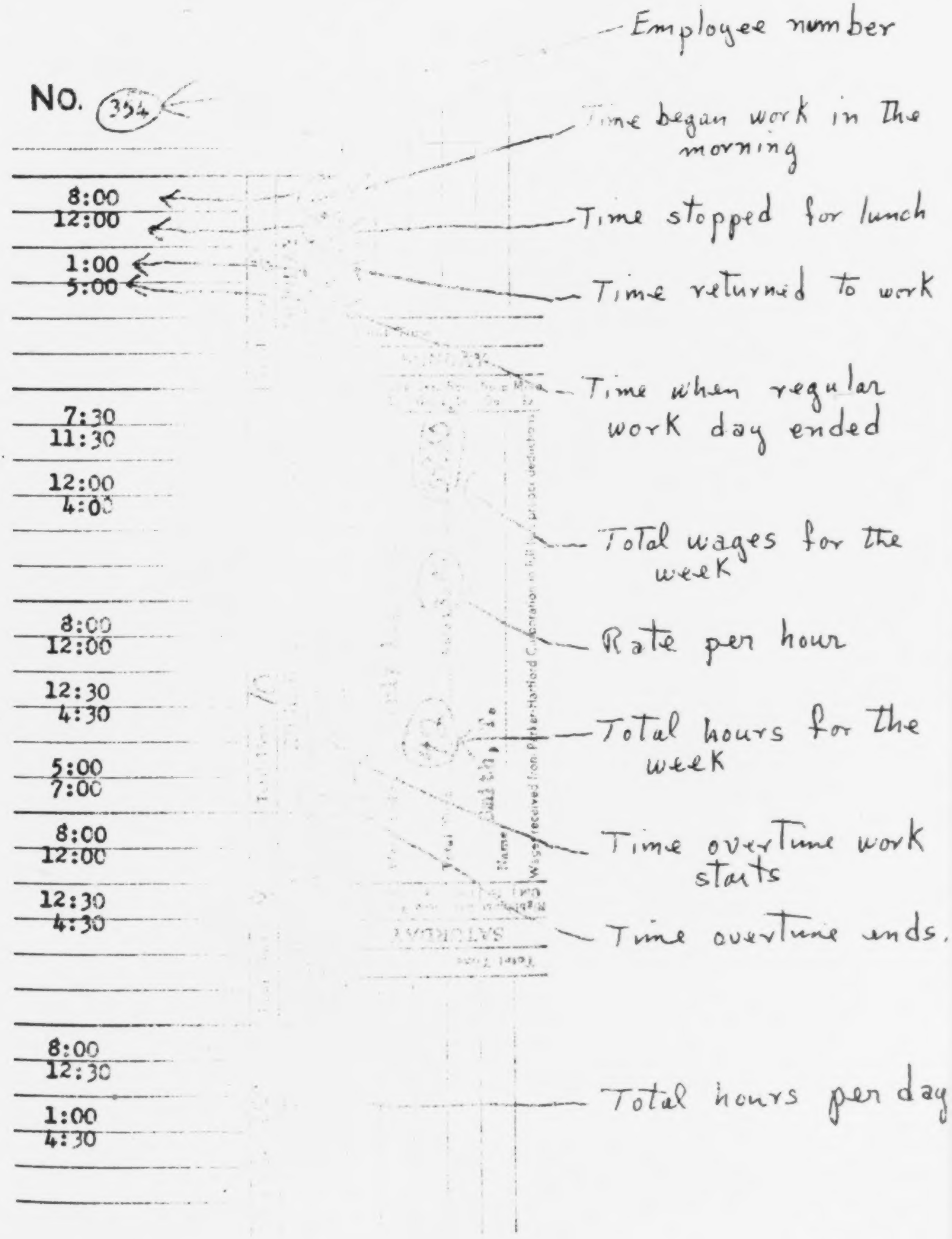
MILES @		
HOURS @ ~~DAYS @~~ ~~WEEKS @~~		
HAND TRK. @		
2 BLANKETS @		
COLL. INS. @		
60 FUEL @ 22¢		
TOTAL CHARGES		
DEPOSIT AMT.	50	—
REFUND DUE AMT.		
NET BALANCE DUE		

7-13 Time Cards

Business and industry use time cards to record the number of hours that a person works. A careful record must be kept of the hours worked. A time clock is often used to record the time - in and time - out.

Most time cards also carry a summary of the total hours each day, the total hours each week, and the earnings for the work. This is usually recorded by a payroll clerk.

Examine the following time card carefully.



NO. 354

8:00
12:00
1:00
5:00

7:30
11:30
12:00
4:00

8:00
12:00
12:30
4:30
5:00
7:00
8:00
12:00
12:30
4:30

8:00
12:30
1:00
4:30

Employee number

Time began work in the morning

Time stopped for lunch

Time returned to work

Time when regular work day ended

Total wages for the week

Rate per hour

Total hours for the week

Time overtime work starts

Time overtime ends.

Total hours per day

7-13 EXERCISES: Complete the following.

1. **PARKER HARTFORD CORP.**

NO. 5285

	Morn In	Noon Out	Noon In	Eve. Out	Night In	Night Out	Total Time
MONDAY	8:00	12:00	12:30	4:30			
TUESDAY	8:00	12:00	1:00	4:00			
WEDNESDAY	8:00	12:00	12:30	4:30			
THURSDAY	8:00	12:00	12:30	4:30			
FRIDAY	8:00	12:30	1:00	4:30			
SATURDAY							
SUNDAY							

Week Ending Nov. 10, 1967

Total Time .... Rate 4.20 Amt. ....

Name Rogers, P.

Wages received from Parker-Hartford Corporation in full less proper deductions

2.

PARKER HARTFORD CORP.

NO. 6758

	Morn In	Noon Out	Noon In	Eve. Out	Night In	Night Out	Total Time
MONDAY					4:30	8:30	
TUESDAY					5:00	7:30	
WEDNESDAY							
THURSDAY					4:30	9:00	
FRIDAY							
SATURDAY	7:30	12:00	12:30	4:00			
SUNDAY							

Week Ending Aug. 18, 1967

Total Time ______ Rate 3.65 Amt. ______

Name Hennis, A

Wages received from Parker-Hartford Corporation in full less proper deductions

7-14 Time Cards - Rates of Pay

Most time cards make provisions for distinguishing regular time from overtime. Regular time is that amount of time considered to be a part of the ordinary work week. Overtime is that time worked above and beyond the regular work hours.

The rates per hour for regular time and overtime are not the same. Overtime rates are generally 1½ to 2 times greater than regular time. **They should be carried out to three decimal places.**

Example 1: Compute the total earnings for the following:

Solution:

	Hours	Rate	Earnings
Regular	35½	1.70	60.35
Overtime	4	2.55	10.20
Total Hours	39½	Total Earnings	70.55

Note: Earnings = Hours worked x Rate per hour

Example 2: John works 44 hours in a certain week. The regular work week is 40 hrs. He is paid $1.55 per hour and the overtime rate is 1½. (Often referred to as "time and a half.") Find his earnings.

Solution:

a) 40 x $1.55 = ________

This is his regular pay.

b) 1.5 x 1.55 = ________

Carry this out to 3 decimal places.

This is his overtime rate.

c) $______ x 4 = $________

This is his overtime pay.

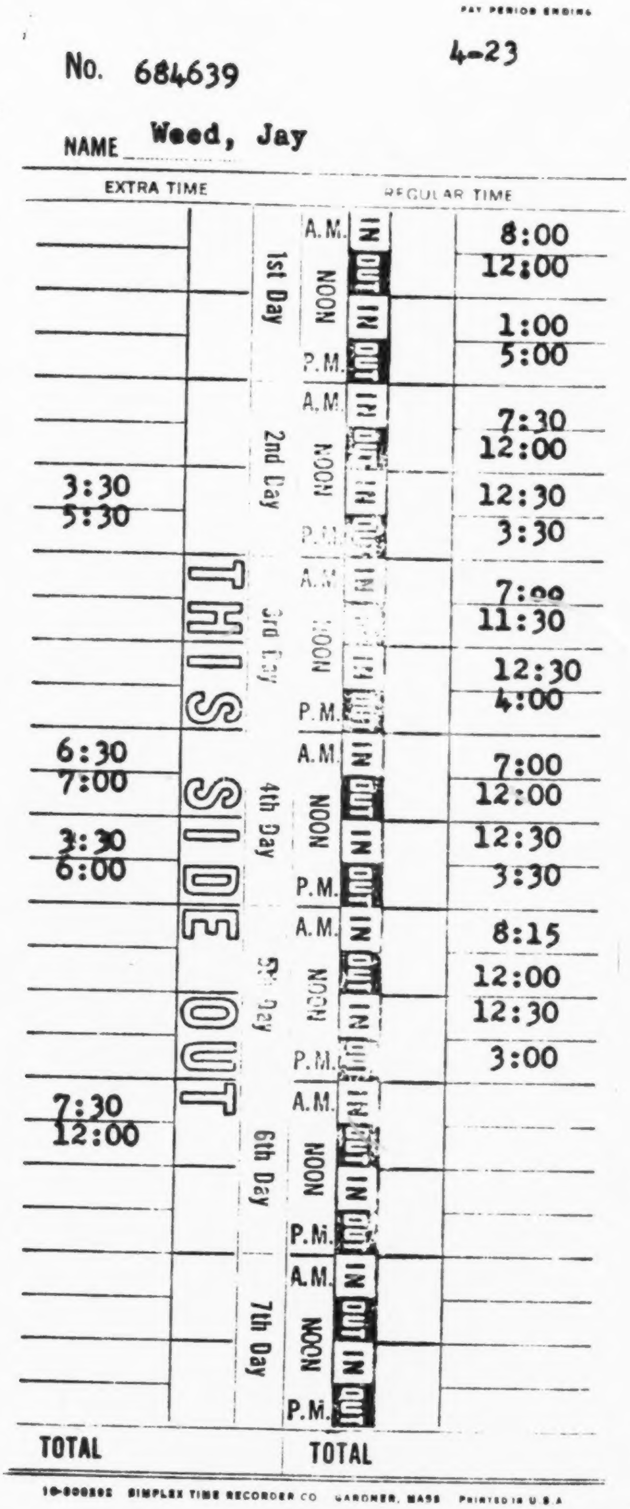
d) ____________ + ____________ = ____________
(Regular pay) + (Overtime pay) = (Total Earnings)

Total earnings for a given time period are often called gross wages.

7-14 EXERCISES: Complete the following table based on a regular work week of 38 hours and an overtime rate of "time and a half."

Employee Number	Total Hours	RATES Regular	 Overtime	EARNINGS Regular	 Overtime	 Gross Wage
1	38	$1.60				
2	42	1.60				
3	40	1.75				
4	48	1.70				
5	44	1.55				
6	43	1.95				
7	50	1.82				
8	41	1.55				
9	47	1.77				
10	49	1.87½				

11. Complete the following time card. Also compute the gross wage at $3.30 per hour regular time and time and a half for overtime.



PAY PERIOD ENDING 4-23

No. 684639

NAME Weed, Jay

EXTRA TIME	Day			REGULAR TIME
	1st Day	A.M.	IN	8:00
		NOON	OUT	12:00
		NOON	IN	1:00
		P.M.	OUT	5:00
	2nd Day	A.M.	IN	7:30
		NOON	OUT	12:00
3:30		NOON	IN	12:30
5:30		P.M.	OUT	3:30
	3rd Day	A.M.	IN	7:00
		NOON	OUT	11:30
		NOON	IN	12:30
		P.M.	OUT	4:00
6:30	4th Day	A.M.	IN	7:00
7:00		NOON	OUT	12:00
3:30		NOON	IN	12:30
6:00		P.M.	OUT	3:30
	5th Day	A.M.	IN	8:15
		NOON	OUT	12:00
		NOON	IN	12:30
		P.M.	OUT	3:00
7:30	6th Day	A.M.	IN	
12:00		NOON	OUT	
		NOON	IN	
		P.M.	OUT	
	7th Day	A.M.	IN	
		NOON	OUT	
		NOON	IN	
		P.M.	OUT	
TOTAL			TOTAL	

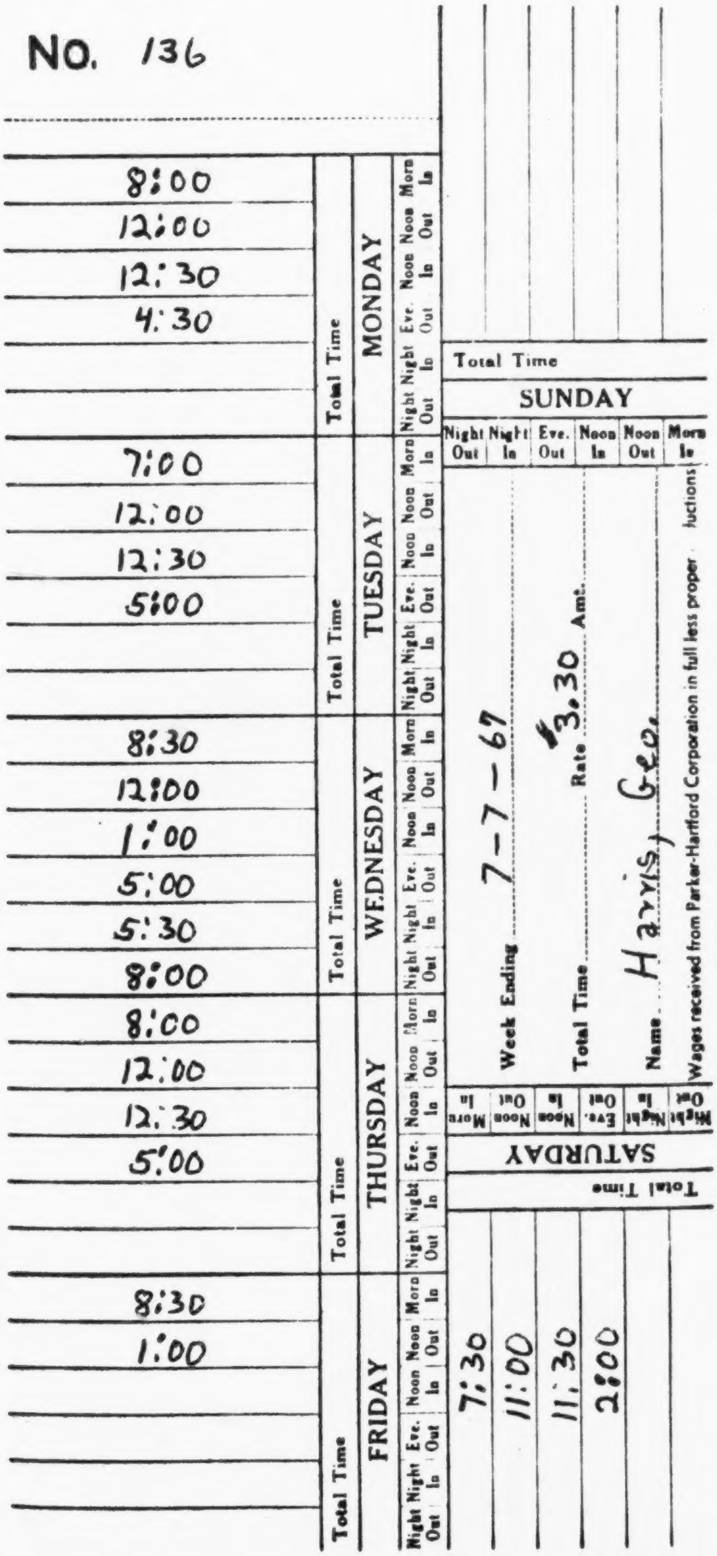
THIS SIDE OUT

16-800302 SIMPLEX TIME RECORDER CO. GARDNER, MASS. PRINTED IN U.S.A.

WHITEHEAD METALS, INC.
P. O. BOX 190
WINDSOR, CONN.

REGULAR	OVERTIME

12. Find the gross wage from the following time card given that the overtime rate is time and a half for all hours over 8 per day and 40 per week.



NO. 136

	Morn In	Noon Out	Noon In	Eve. Out	Night In	Night Out	Total Time
MONDAY	8:00	12:00	12:30	4:30			
TUESDAY	7:00	12:00	12:30	5:00			
WEDNESDAY	8:30	12:00	1:00	5:00	5:30	8:00	
THURSDAY	8:00	12:00	12:30	5:00			
FRIDAY	8:30	1:00					
SATURDAY	7:30	11:00	11:30	2:00			
SUNDAY							

Week Ending 7-7-67

Total Time Rate $3.30 Amt.

Name Harris, Geo.

Wages received from Parker-Hartford Corporation in full less proper deductions

225

7-15 Time Cards - Piece Work

In many industries employees are paid by the amount of work they accomplish during a day. That is, their pay is based on the number of articles or pieces that they complete per day. This is called piece work.

Example 1: Find the total earnings for the following.

15 pieces @ 25¢

50 pieces @ 10¢

Solution:

15 x .25 = 7.50

50 x .10 = 5.00

Total Earnings $12.50 Answer

That is:

Earnings = No. of pieces x Price per piece.

7-15 EXERCISES: Complete the following table.

Employee Number	TOTAL		RATE		EARNINGS		
	Hours	Pieces	Hour	Piece	Hourly	Piece	Gross
1	30	10	1.55	1.05			
2	—	70	1.50	.92			
3	42	—	1.70	—			
4	32	64	1.85	.26			
5	20	84	1.75	.42			
6	16	25	1.82	2.02			
7	20	85	1.60	.40			
8	30	135	2.05	.15			

7-16 Payroll - Income Tax

When a person earns money there are certain amounts of money taken out of his total earnings each week before he gets his net pay. These amounts are called deductions.

One of these deductions is Federal Income Tax. If you make over $600.00 per year you must pay income tax. The employer is required to deduct the estimated income tax from the wages of his employees. This money is sent to the Collector of Internal Revenue's offices where it is entered on each employee's account. This deduction is often referred to as withholding tax.

Example 1: Ray Ellis earns $65 a week. His employer is required to deduct 14% of this for income tax. How much is deducted?

Solution:

.14 x 65 or $9.10 Answer

What is Ray's net pay? ________

The actual amount of income tax deducted is based on the amount of money earned by the employee and the number of exemptions he is entitled to. The government supplies withholding tables to the employer for determining these amounts. The following rule can also be used:

Withholding tax = .14 (Gross pay - $13.50 times the number of exemptions.)

Example 2: Find the withholding tax on a gross pay of $82 when the employee is entitled to 2 exemptions.

Solution:

a) 2 x 13.50 = $27.00 13.50 times the number of exemptions

b) \$82 - 27 = \$55   Subtract (a) from the gross pay, \$82.

c) .14 x \$55 = \$7.70   Multiply (b) by .14, we get the withholding tax, \$7.70.

Note carefully the order in which we did this work.

Step 1: Multiply the number of exemptions by \$13.50.

Step 2: Subtract this result from the gross pay.

Step 3: Multiply this difference by .14.

7-16 EXERCISES: Find the tax to be withheld from each of the following gross wages with the given number of exemptions.

Employee Number	Gross Wage	No. of Exemptions	Withholding Tax
1	\$140	2	
2	90	1	
3	202	5	
4	122	9	
5	60	5	
6	182	3	
7	115	1	
8	252	4	
9	66	1	
10	78	2	

On the following page you will find a portion of a table supplied by the government. Find the withholding tax for the following:

	Gross Wage	No. of exemptions (Married)	Withholding Tax
11.	$ 84.00	2	$
12.	$270.00	5	
13.	$112.50	2	
14.	$229.75	10	
15.	$495.00	4	
16.	$76.50	1	
17.	$135.00	2	
18.	$ 94.75	3	
19.	$ 80.50	2	
20.	$102.70	4	

And the wages are—		And the number of withholding exemptions claimed is—										
At least	But less than	0	1	2	3	4	5	6	7	8	9	10 or more
		The amount of income tax to be withheld shall be—										
$76	$78	$10.80	$8.80	$6.70	$4.70	$2.70	$.80	$0	$0	$0	$0	$0
78	80	11.10	9.10	7.00	5.00	3.00	1.10	0	0	0	0	0
80	82	11.40	9.40	7.30	5.30	3.30	1.40	0	0	0	0	0
82	84	11.70	9.70	7.60	5.60	3.60	1.70	0	0	0	0	0
84	86	12.00	10.00	7.90	5.90	3.90	1.90	.10	0	0	0	0
86	88	12.30	10.30	8.20	6.20	4.20	2.20	.30	0	0	0	0
88	90	12.70	10.60	8.50	6.50	4.50	2.50	.60	0	0	0	0
90	92	13.00	10.90	8.80	6.80	4.80	2.80	.90	0	0	0	0
92	94	13.30	11.20	9.10	7.10	5.10	3.10	1.20	0	0	0	0
94	96	13.70	11.50	9.40	7.40	5.40	3.40	1.50	0	0	0	0
96	98	14.00	11.80	9.70	7.70	5.70	3.70	1.70	0	0	0	0
98	100	14.40	12.10	10.00	8.00	6.00	4.00	2.00	.10	0	0	0
100	105	15.00	12.70	10.60	8.50	6.50	4.50	2.50	.60	0	0	0
105	110	15.80	13.50	11.30	9.30	7.30	5.30	3.20	1.30	0	0	0
110	115	16.70	14.40	12.10	10.00	8.00	6.00	4.00	2.00	.10	0	0
115	120	17.50	15.20	12.90	10.80	8.80	6.80	4.70	2.70	.80	0	0
120	125	18.40	16.10	13.80	11.50	9.50	7.50	5.50	3.50	1.50	0	0
125	130	19.20	16.90	14.60	12.30	10.30	8.30	6.20	4.20	2.20	.40	0
130	135	20.10	17.80	15.50	13.20	11.00	9.00	7.00	5.00	3.00	1.10	0
135	140	20.90	18.60	16.30	14.00	11.80	9.80	7.70	5.70	3.70	1.80	0
140	145	21.80	19.50	17.20	14.90	12.60	10.50	8.50	6.50	4.50	2.50	.60
145	150	22.60	20.30	18.00	15.70	13.50	11.30	9.20	7.20	5.20	3.20	1.30
150	160	23.90	21.60	19.30	17.00	14.70	12.40	10.40	8.30	6.30	4.30	2.30
160	170	25.60	23.30	21.00	18.70	16.40	14.10	11.90	9.80	7.80	5.80	3.80
170	180	27.50	25.00	22.70	20.40	18.10	15.80	13.60	11.30	9.30	7.30	5.30
180	190	29.50	26.80	24.40	22.10	19.80	17.50	15.30	13.00	10.80	8.80	6.80
190	200	31.50	28.80	26.10	23.80	21.50	19.20	17.00	14.70	12.40	10.30	8.30
200	210	33.50	30.80	28.10	25.50	23.20	20.90	18.70	16.40	14.10	11.80	9.80
210	220	35.50	32.80	30.10	27.40	24.90	22.60	20.40	18.10	15.80	13.50	11.30
220	230	37.50	34.80	32.10	29.40	26.70	24.30	22.10	19.80	17.50	15.20	12.90
230	240	39.50	36.80	34.10	31.40	28.70	26.00	23.80	21.50	19.20	16.90	14.60
240	250	41.50	38.80	36.10	33.40	30.70	28.00	25.50	23.20	20.90	18.60	16.30
250	260	43.50	40.80	38.10	35.40	32.70	30.00	27.30	24.90	22.60	20.30	18.00
260	270	45.50	42.80	40.10	37.40	34.70	32.00	29.30	26.60	24.30	22.00	19.70
270	280	47.50	44.80	42.10	39.40	36.70	34.00	31.30	28.60	26.00	23.70	21.40
At least	But less than	0	1	2	3	4	5	6	7	8	9	10 or more
280	290	49.50	46.80	44.10	41.40	38.70	36.00	33.30	30.60	27.90	25.40	23.10
290	300	51.50	48.80	46.10	43.40	40.70	38.00	35.30	32.60	29.90	27.20	24.80
300	310	53.50	50.80	48.10	45.40	42.70	40.00	37.30	34.60	31.90	29.20	26.50
310	320	55.50	52.80	50.10	47.40	44.70	42.00	39.30	36.60	33.90	31.20	28.50
320	330	57.50	54.80	52.10	49.40	46.70	44.00	41.30	38.60	35.90	33.20	30.50
330	340	59.50	56.80	54.10	51.40	48.70	46.00	43.30	40.60	37.90	35.20	32.50
340	350	61.70	58.80	56.10	53.40	50.70	48.00	45.30	42.60	39.90	37.20	34.50
350	360	64.20	60.80	58.10	55.40	52.70	50.00	47.30	44.60	41.90	39.20	36.50
360	370	66.70	63.30	60.10	57.40	54.70	52.00	49.30	46.60	43.90	41.20	38.50
370	380	69.20	65.80	62.50	59.40	56.70	54.00	51.30	48.60	45.90	43.20	40.50
380	390	71.70	68.30	65.00	61.60	58.70	56.00	53.30	50.60	47.90	45.20	42.50
390	400	74.20	70.80	67.50	64.10	60.70	58.00	55.30	52.60	49.90	47.20	44.50
400	410	76.70	73.30	70.00	66.60	63.20	60.00	57.30	54.60	51.90	49.20	46.50
410	420	79.20	75.80	72.50	69.10	65.70	62.40	59.30	56.60	53.90	51.20	48.50
420	430	81.80	78.30	75.00	71.60	68.20	64.90	61.50	58.60	55.90	53.20	50.50
430	440	84.80	80.80	77.50	74.10	70.70	67.40	64.00	60.60	57.90	55.20	52.50
440	450	87.80	83.80	80.00	76.60	73.20	69.90	66.50	63.10	59.90	57.20	54.50
450	460	90.80	86.80	82.70	79.10	75.70	72.40	69.00	65.60	62.30	59.20	56.50
460	470	93.80	89.80	85.70	81.70	78.20	74.90	71.50	68.10	64.80	61.40	58.50
470	480	96.80	92.80	88.70	84.70	80.70	77.40	74.00	70.60	67.30	63.90	60.50
480	490	99.80	95.80	91.70	87.70	83.60	79.90	76.50	73.10	69.80	66.40	63.00
490	500	102.80	98.80	94.70	90.70	86.60	82.60	79.00	75.60	72.30	68.90	65.50
500	510	105.80	101.80	97.70	93.70	89.60	85.60	81.60	78.10	74.80	71.40	68.00
510	520	108.80	104.80	100.70	96.70	92.60	88.60	84.60	80.60	77.30	73.90	70.50
520	530	111.80	107.80	103.70	99.70	95.60	91.60	87.60	83.50	79.80	76.40	73.00
530	540	114.80	110.80	106.70	102.70	98.60	94.60	90.60	86.50	82.50	78.90	75.50
540	550	117.80	113.80	109.70	105.70	101.60	97.60	93.60	89.50	85.50	81.40	78.00
550	560	120.80	116.80	112.70	108.70	104.60	100.60	96.60	92.50	88.50	84.40	80.50
560	570	123.80	119.80	115.70	111.70	107.60	103.60	99.60	95.50	91.50	87.40	83.40
		30 percent of the excess over $570 plus—										
570 and over		125.30	121.30	117.20	113.20	109.10	105.10	101.10	97.00	93.00	88.90	84.90

WEEKLY—Married—Wages $76 to 570 and over

7-17 Payroll - Social Security

Another payroll deduction is Social Security. The Social Security tax is money deducted from the employee's earnings to help pay old age pensions and Medicare payments. Employers pay the same amount, matching the amounts paid by the employees.

The social security tax is increased from time to time to help pay for additional benefits that Congress adds to the program. The present rate is 4.8%.

7-17 EXERCISES: Find the amount of social security tax to be deducted from each of the following total earnings.

	Total Earnings	Social Security Tax
1.	$ 38.25	$
2.	$ 62.40	
3.	$ 49.32	
4.	$ 82.25	
5.	$ 26.22	
6.	$137.70	

Problems:

7. Bud Hawley worked 47 hours during a certain week. The regular work week is 40 hours and the overtime rate is 2 times the regular rate. If his regular rate is $1.95per hour, find his gross wages, the amount of social security to be deducted, and the net pay.

8. Jean Swanson worked 42 hours during a week. Her regular work week is 35 hours and her overtime rate is at time and a half. At a regular rate of $1.72 per hour, find her gross wage, the amount of social security to be deducted, and her net pay.

7-18 Payroll - Summary Sheets

Many employers, as a service to their employees , deduct amounts from total earnings for various other reasons. These deductions may be the same for all employees or based on the earnings of the employee.

For example:

Hospitalization:

Family Plan - $3.70 per week

Single Plan - $2.80 per week

Laundry Costs:

$1.75 per week

Insurance:

Life and Disability-1% of gross pay

Personal Loans:

Amounts vary according to the size of the original loan.

Union Dues:

50¢ per week

In order to keep an accurate record of these deductions and also the other deductions that we have talked about, pay roll summary sheets are used. These sheets give the employer a complete record of wages and deductions for each employee.

7-18 EXERCISES

1. Complete the Payroll Summary Sheets on the next pages. The overtime rate is time and a half. All employees pay the Laundry Cost and carry the Life and Disability Insurance at the rates listed above. Other deductions are listed where they apply. The hourly rate is given beside each name. The regular work week is 40 hours. Your teacher will tell you whether to use the formula or the table for finding the amount of tax to be withheld.

1.

PAYROLL SUMMARY

(Note: F.I.C.A. is Social Security.)

EMPLOYEE		TOTAL HOURS	EARNINGS				DEDUCTIONS						NET AMOUNT	PERIOD ENDING	NUMBER OF Dependents		
			REGULAR	OVERTIME		GROSS PAY	F.I.C.A.	FEDERAL WH/TAX	Hosp.	Ins	Loan	Laundry					
Allen, J. 2.00/hr.	1	40	80.00	—	—	80.00	3.84	9.31	2.80	.80	—	1.75	61.50	9/10	1		1
Ball, G. 2.62/hr.	2	42							3.70		—				3		2
Brewer, G. 2.10/hr.	3	42							—		5.00				1		3
Carr, B. 2.05/hr.	4	44							2.80		—				1		4
Dean, R. 3.12/hr.	5	46							3.70		10.00				5		5
Down, H. 2.65/hr.	6	38							3.70		—				4		6
Fallow, F. 2.62/hr.	7	41							3.70		—				2		7
Johnson, C. 3.30/hr.	8	43							—		5.00				4		8
Learner, S. 2.85/hr.	9	39							2.80		—				1		9
Morgan, H. 2.62/hr.	10	38							3.70		—				5		10
Tomolonis, S 2.95/hr.	11	40							—		10.00				0		11
Well, N 2.62/hr.	12	36							2.80		—				2		12
	13																13
TOTALS	14																14
	15																15
	16																16
	17																17
	18																18
	19																19
	20																20

234

2.

PAYROLL SUMMARY

EMPLOYEE			TOTAL HOURS	EARNINGS				DEDUCTIONS						NET AMOUNT	PERIOD ENDING	NUMBER Dependents		
				REGULAR	OVERTIME		GROSS PAY	F.I.C.A.	FEDERAL WH/TAX	Hosp.	Ins.	Loan	Laundry					
Brown, J. 2.05/hr.	1		42							3.70		—			11/2	2		1
Boris, S 1.75/hr.	2		44							—		—				1		2
Call, J. 2.25/hr.	3		40							3.70		5.00				4		3
Carey, B. 1.80/hr.	4		38							2.80		—				1		4
Crow, G. 2.25/hr.	5		45							3.70		—				2		5
Gray, H. 2.05/hr.	6		47							—		—				1		6
Gray, W. 2.05/hr.	7		41							—		—				1		7
Johnson, S 1.95/hr.	8		50							—		10.00				0		8
Mills, C. 1.60/hr.	9		32							2.80		—				1		9
Moran, J. 1.70/hr.	10		43							—		—				1		10
Reed, R. 2.25/hr.	11		48							3.70		—				5		11
Smith, J. 2.00/hr.	12		46							—		5.00				2		12
Torn, R. 1.90/hr.	13		40							—		—				1		13
Warren, S. 1.80/hr.	14		41½							2.80		—				1		14
	15																	15
TOTALS	16															—	—	16
	17																	17
	18																	18
	19																	19
	20																	20

Pg
236

3.

PAYROLL SUMMARY

EMPLOYEE			TOTAL HOURS	EARNINGS				DEDUCTIONS						NET AMOUNT	PERIOD ENDING	NUMBER Dependents		
				REGULAR	OVERTIME		GROSS PAY	FICA	FEDERAL WH/TAX	Dues	Hosp.	Ins.	Savings					
Able, R 2.62/hr.	1		42							.50	—		5 00		1-7	1		1
Bonk, L. 2.85/hr	2		40							.50	2.80		—			1		2
Carlson, S. 3.12/hr.	3		42							.50	3.70		—			4		3
Dale, D 3.30/hr	4		48							.50	3.70		10.00			5		4
Fuller, S. 2.62/hr.	5		43							.50	—		—			2		5
Hartmann, S 2.85/hr	6		45							.50	2.80		—			1		6
Levin, H. 3.30/hr.	7		41½							.50	3.70		—			3		7
Melon, G 3.15/hr.	8		48½							.50	3.70		5 00			4		8
North, S. 2.62/hr.	9		36							.50	2.80		5.00			1		9
Raim, C 3.05/hr.	10		44							.50	3.70		—			2		10
Swain, T. 3.30/hr.	11		47							.50	3.70		10.00			5		11
Twain, M. 3.12/hr	12		42½							.50	2.80		—			1		12
Udall, M. 3.12/hr	13		43							.50	3.70		—			3		13
Wills, M. 3.30/hr.	14		50							.50	3.70		—			6		14
	15																	15
TOTALS	16																	16
	17																	17
	18																	18
	19																	19
	20																	20

Pg
236

4. The following is a summary sheet of an individuals earnings for one quarter of a year. Complete where required. Do not forget totals at bottom of sheet. FOA means the same as FICA. This employee has four dependents.

FIRST QUARTER – 19 67

PAY PERIOD	REGULAR TIME		OVERTIME		TOTAL EARNINGS	DEDUCTIONS						NET EARNINGS	
	TIME	RATE	HRS	RATE		F.O.A.	WITH-HOLDING	LOCAL	Ins.	Loan		AMOUNT	DATE PAID
1-6	38	2.80	—	—				.50	3.70	5.00			
1-13	36	2.80	—	—				"	"	"			
1-20	38	"	4	4.20				"	"	"			
1-27	38	"	2	"				"	"	"			
2-3	36	"	5	"				"	"	"			
2-10	38	"	10	"				"	"	"			
2-17	30	"	—	—				"	"	"			
2-24	38	"	8	"				"	"	"			
3-3	38	"	—	—				"	"	"			
3-10	38	"	—	—				"	"	"			
3-17	38	"	—	—				"	"	"			
3-24	38	"	6	"				"	"	"			
3-31	38	"	8	"				"	"	"			
TOTAL QTR.													

5. Complete the following summary. The regular rate is $2.85 per hour and overtime rate is double time over 40 hrs. Insurance is carried by the employee and is based on 1% of the total earnings. This employee has three exemptions for purposes of income tax withheld.

SECOND QUARTER – 1967

PAY PERIOD	REGULAR TIME		OVERTIME		TOTAL EARNINGS	DEDUCTIONS						NET EARNINGS	
	TIME	RATE	HRS.	RATE		F.O.A.	WITH-HOLDING	LOCAL	Ins.	Hosp.		AMOUNT	DATE PAID
4-7	40		—							3.70			
4-14	40		2										
4-21	36		—										
4-28	40		4										
5-5	40		2										
5-12	40		—										
5-19	40		5										
5-26	40		1										
6-2	40		8										
6-9	37		—										
6-16	33		—										
6-23	40		9										
6-30	40		3										
TOTAL QTR.													

7-19 Review Exercises

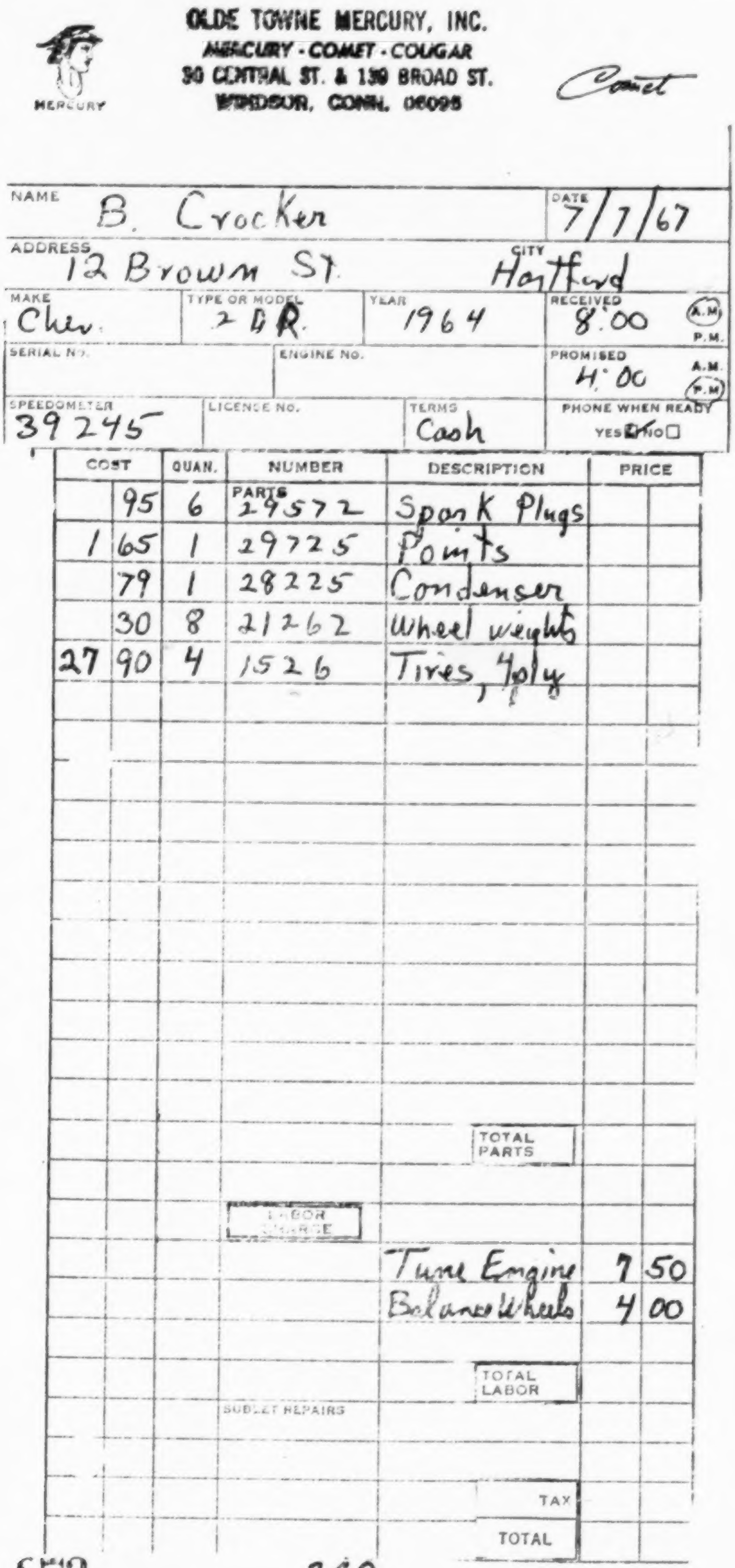
1. Complete the following:

Item	Quantity	Price	Extension
A	112	$ .75	
B	62	1.25	
C	83	1.75	
D	220	3.05	
E	56	5.55	________
		Total	
		Discount 5%	________
		Net Total	
		3½% Tax	________
		TOTAL	

2. Find the net price in each of the following:

	List Price	Discounts	Net Price
a.	$ 9.80	30-22	$
b.	27.60	15-12-10	
c.	190.65	20-10-5	
d.	65.20	10-10-5	
e.	2.25	40-10-5	

3. Complete the following:



OLDE TOWNE MERCURY, INC.
MERCURY - COMET - COUGAR
30 CENTRAL ST. & 139 BROAD ST.
WINDSOR, CONN. 06095

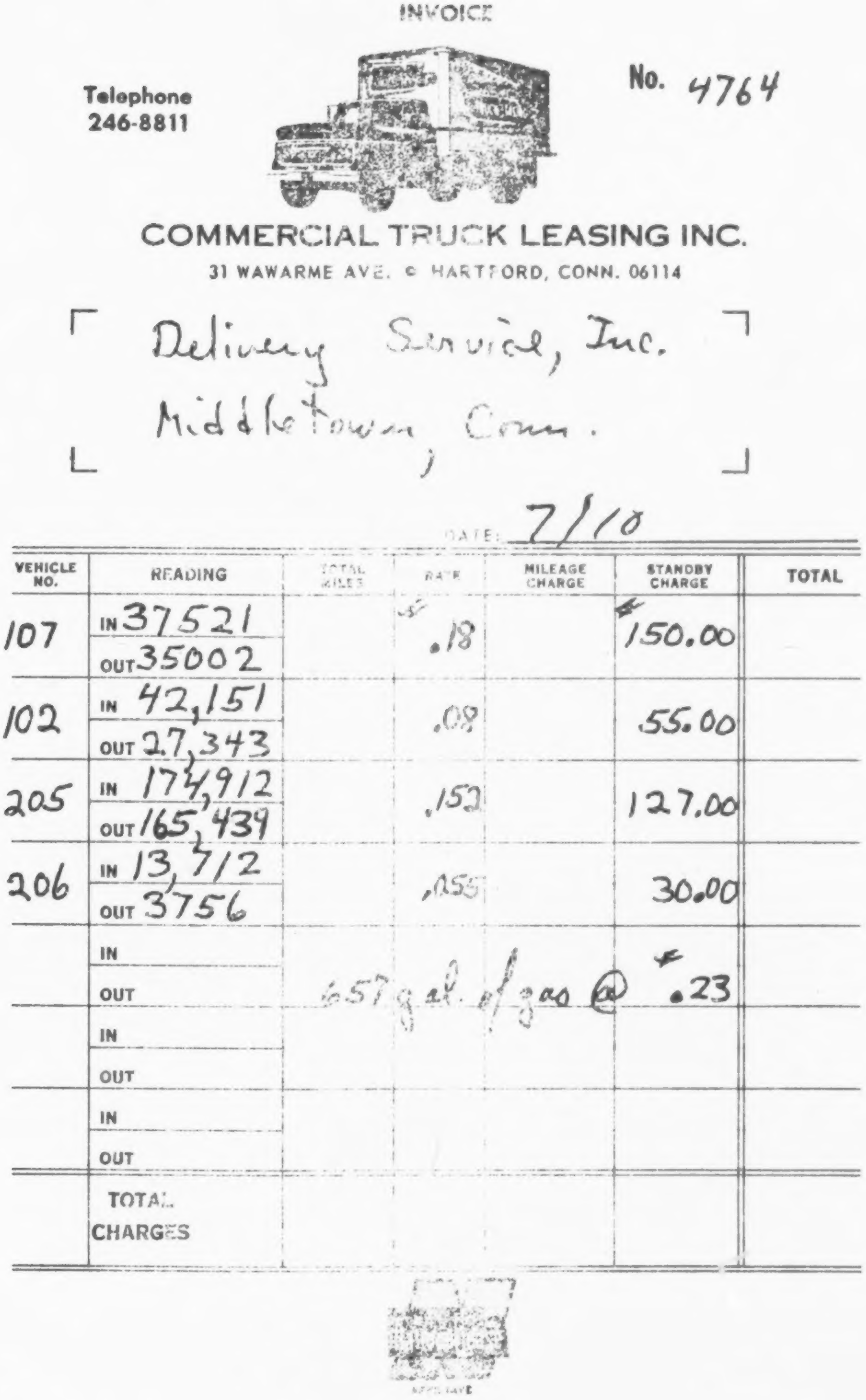
MERCURY

Comet

NAME B. Crocker
DATE 7/7/67
ADDRESS 12 Brown St.
CITY Hartford
MAKE Chev.
TYPE OR MODEL 2 DR.
YEAR 1964
RECEIVED 8:00 [✓ A.M.] P.M.
SERIAL NO.
ENGINE NO.
PROMISED 4:00 A.M. [✓ P.M.]
SPEEDOMETER 39245
LICENCE NO.
TERMS Cash
PHONE WHEN READY YES ☑ NO ☐

COST		QUAN.	NUMBER	DESCRIPTION	PRICE	
	95	6	PARTS 29572	Spark Plugs		
1	65	1	29725	Points		
	79	1	28225	Condenser		
	30	8	21262	Wheel weights		
27	90	4	1526	Tires, 4 ply		
				TOTAL PARTS		
			LABOR CHARGE			
				Tune Engine	7	50
				Balance Wheels	4	00
				TOTAL LABOR		
			SUBLET REPAIRS			
				TAX		
				TOTAL		

4. Complete the following:



INVOICE

Telephone
246-8811

No. 4764

COMMERCIAL TRUCK LEASING INC.

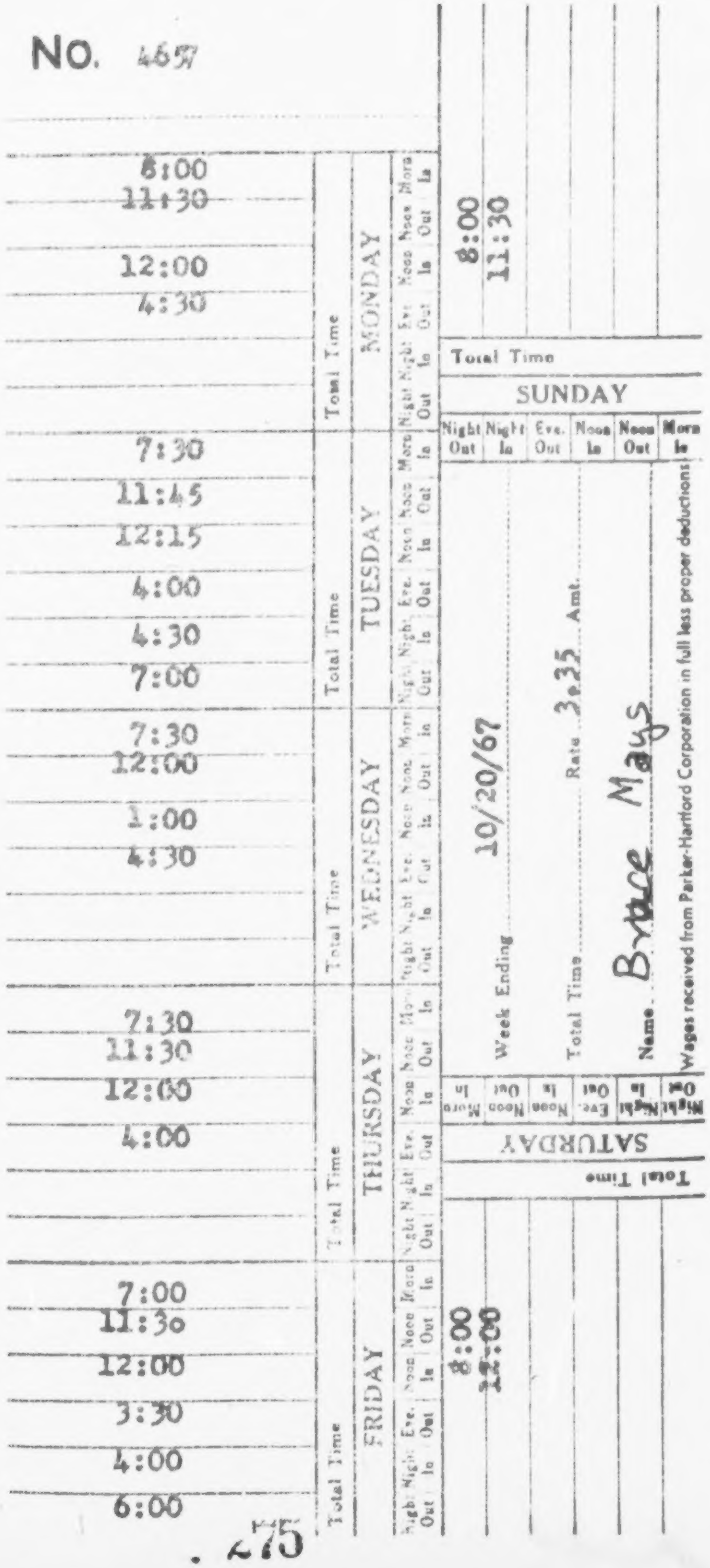
31 WAWARME AVE. · HARTFORD, CONN. 06114

Delivery Service, Inc.
Middletown, Conn.

DATE: 7/10

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
107	IN 37521		$.18		$150.00	
	OUT 35002					
102	IN 42,151		.08		55.00	
	OUT 27,343					
205	IN 174,912		.152		127.00	
	OUT 165,439					
206	IN 13,712		.055		30.00	
	OUT 3756					
	IN					
	OUT	657 gal. of gas @			$.23	
	IN					
	OUT					
	IN					
	OUT					
	TOTAL CHARGES					

5. Complete the following time card. The overtime rate is "time and a half" over 40 hrs. per week except for Sunday which is "double time."



NO. 465

MONDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
8:00
11:30
12:00
4:30

TUESDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
7:30
11:45
12:15
4:00
4:30
7:00

WEDNESDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
7:30
12:00
1:00
4:30

THURSDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
7:30
11:30
12:00
4:00

FRIDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
7:00
11:30
12:00
3:30
4:00
6:00

SUNDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
8:00
11:30

SATURDAY — Morn In / Noon Out / Noon In / Eve. Out / Night In / Night Out — Total Time
8:00
12:00

Week Ending 10/20/67

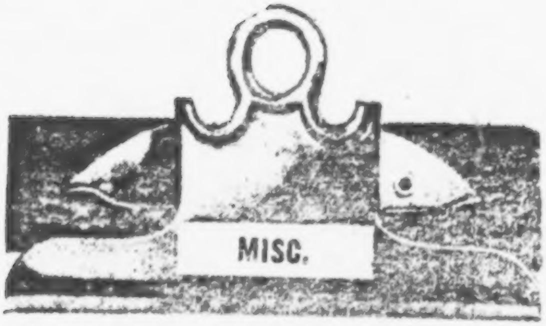
Total Time .... Rate 3.35 Amt. ....

Name. Bruce Mays

Wages received from Parker-Hartford Corporation in full less proper deductions.

. 275

6. Find the per cent of discount on each of the following items:



INVENTORY STOCK CONTROL LIST

	DESCRIPTION: *Rugs*	Price Regular	SALE PRICE	Per-Cent Discount
a.	9x12 Braided Rugs	$ 69.00	$ 35.00	
b.	9x12 Axminster Rug	$ 79.00	$ 29.00	
c	9x12 Nylon Rugs	$ 59.00	$ 29.00	
d	Cont. Fil. Nylon Carpet sq. yd.	$ 8.95	$ 4.69	
e	9x12 Viscose Rug	$ 29.00	$ 13.00	
f	9x12 Axminster Rug	$ 79.00	$ 49.00	
g	9x12 (approx. Foam Back Rugs	$ 24.00	$ 11.00	
h	9x12 Commercial Grade Nylon Rugs	$109.00	$ 69.00	
i.	Woolen or Nylon Carpet yd.	$ 5.95	$ 3.98	

DINETTES

	DESCRIPTION: *Dinettes*	Regular Price	SALE PRICE
j	5 Pc. Dinette	$ 69.00	$ 44.00
k.	7 Pc. 36x48x60 Table, 6 Chairs, as is	$ 79.00	$ 27.00
l.	7 Pc. Deluxe Dinette	$149.00	$ 89.00
m	9 Pc. King-size 72" Table, 8 Chairs	$145.00	$ 88.00

Use this rule to find the withholding tax in the following:

Withholding tax = .14 (Gross - $13.50 times the number of exemptions)

7. Jones is single, earns $90 weekly, and is entitled to one exemption.

   a. Find the amount to be withheld for income tax.

   b. Find the deduction for Social Security - Medicare at the 4.8% rate.

   c. Find his net pay.

8. Smith is married with 2 dependent children, earns $160 per week, and claims 4 withholding exemptions.

   a. Find the amount to be withheld for taxes.

   b. Find the deduction for Social Security-Medicare tax.

c. A deduction of ½% of his gross pay is made for insurance. What does this deduction amount to?

d. Find his net pay.

9. **Complete the following using the table on page 212.**

VEHICLE NO.	59					
SIZE	14' Rack					
CAR. CAPACITY LBS.	9,000 lbs.					
RATE PER	day $15					
RATE PER MILE	.15					
INCLUDING FUEL	YES ☐	NO ☑				
LIABILITY INSURANCE FURNISHED BY	LESSOR ☑	LESSEE ☐				
FULL COLLISION COVERAGE	YES ☑	NO ☐				
TIME IN	5: P.M. 11/10					
TIME OUT	8:00 AM. 11/7					
TOTAL TIME						
MILEAGE IN	3	2	0	1	2	
MILEAGE OUT	3	0	1	5	9	—
TOTAL MILES						

CHARGES		
MILES @		
HOURS @ DAYS @ WEEKS @		
1 HAND TRK. @ 2.00		
BLANKETS @		
COLL. INS. @		
195 gal FUEL @ .23		
TOTAL CHARGES		
DEPOSIT AMT.		
REFUND DUE AMT.		
NET BALANCE DUE		

VEHICLE NO.	9					
SIZE	Trailer-Platform					
CAR. CAPACITY LBS.	44,000					
RATE PER	hr. $2.00					
RATE PER MILE	$.03					
INCLUDING FUEL	YES ☐	NO ☑				
LIABILITY INSURANCE FURNISHED BY	LESSOR ☑	LESSEE ☐				
FULL COLLISION COVERAGE	YES ☑	NO ☐				
TIME IN	1:30 P.M. 2/2					
TIME OUT	7:30 AM 2/2					
TOTAL TIME						
MILEAGE IN	2	5	6	2	—	—
MILEAGE OUT	2	4	7	9	—	—
TOTAL MILES						

CHARGES		
MILES @		
HOURS @ DAYS @ WEEKS @		
HAND TRK. @		
7 BLANKETS @ .35		
COLL. INS. @ $1.50		
FUEL @		
TOTAL CHARGES		
DEPOSIT AMT.		
REFUND DUE AMT.		
NET BALANCE DUE		

STATEMENT

GRIFFING T.V., INC.

238 Bloomfield Ave. Windsor, Conn. 06095

Windsor
688-6271

Windsor Locks
623-7243

Date ____________________

DATE	DESCRIPTION	CHARGES	CREDITS	BALANCE

ANY CHARGES OR PAYMENTS MADE AFTER
THE 25TH OF THE MONTH WILL APPEAR ON THE NEXT STATEMENT.

STATEMENT

GRIFFING T.V., INC.

238 Bloomfield Ave. Windsor, Conn. 06095

Windsor
688-6271

Windsor Locks
623-7243

Date ____________________

DATE	DESCRIPTION	CHARGES	CREDITS	BALANCE

ANY CHARGES OR PAYMENTS MADE AFTER
THE 25TH OF THE MONTH WILL APPEAR ON THE NEXT STATEMENT

OLDE TOWNE MERCURY, INC.
MERCURY - COMET - COUGAR
30 CENTRAL ST. & 139 BROAD ST
WINDSOR, CONN. 06095

____________________ 19____

Name ____________________

Address ____________________

City ____________________

TERMS: Net 10 days [illegible]

Quantity	Description	Price	Total
		Tax	
		Total	

Tires — Batteries — Lubrication — Washing — Brake Service — Muffler Service

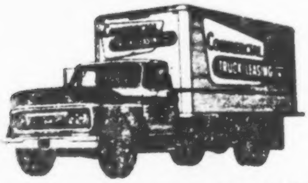
RETURN THIS STATEMENT FOR CORRECTION IN CASE OF ERROR

19____

M __________

To __________ Dr.

INVOICE



No.

Telephone
246-8811

COMMERCIAL TRUCK LEASING INC.

31 WAWARME AVE. • HARTFORD, CONN. 06114

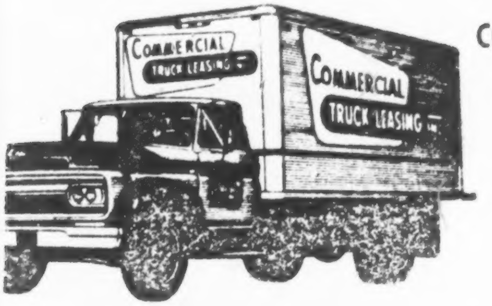
DATE:

VEHICLE NO.	READING	TOTAL MILES	RATE	MILEAGE CHARGE	STANDBY CHARGE	TOTAL
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	IN					
	OUT					
	TOTAL CHARGES					

NationaLease
AFFILIATE

245-c

SEEN EVERYWHERE



TRUCK RENTAL AGREEMENT

COMMERCIAL TRUCK LEASING, INC.

INVOICE NO.

31 WAWARME AVE.
HARTFORD, CONN. 06114
TEL. 246-8811

NEW BRITAIN BRANCH
1010 WEST MAIN ST.
TEL. 229-0309

NATIONAL TRUCK LEASING
SYSTEM AFFILIATE

VEHICLE NO.
SIZE
CAR. CAPACITY LBS.
RATE PER
RATE PER MILE
INCLUDING FUEL YES ☐ NO ☐

LIABILITY INSURANCE FURNISHED BY
LESSOR ☐ LESSEE ☐
FULL COLLISION COVERAGE
YES ☐ NO ☐

TIME IN
TIME OUT
TOTAL TIME

MILEAGE IN					
MILEAGE OUT					
TOTAL MILES					

CHARGES

MILES @		
HOURS @ DAYS @ WEEKS @		
HAND TRK. @		
BLANKETS @		
COLL. INS. @		
FUEL @		
TOTAL CHARGES		
DEPOSIT AMT.		
REFUND DUE AMT.		
NET BALANCE DUE		

VEHICLE NO.
SIZE
CAR. CAPACITY LBS.
RATE PER
RATE PER MILE
INCLUDING FUEL YES ☐ NO ☐

LIABILITY INSURANCE FURNISHED BY
LESSOR ☐ LESSEE ☐
FULL COLLISION COVERAGE
YES ☐ NO ☐

TIME IN
TIME OUT
TOTAL TIME
MILEAGE IN
MILEAGE OUT
TOTAL MILES

CHARGES
MILES @
HOURS @
DAYS @
WEEKS @
HAND TRK. @
BLANKETS @
COLL. INS. @
FUEL @
TOTAL CHARGES
DEPOSIT AMT.
REFUND DUE AMT.
NET BALANCE DUE

VEHICLE NO.
SIZE
CAR. CAPACITY LBS.
RATE PER
RATE PER MILE
INCLUDING FUEL YES ☐ NO ☐

LIABILITY INSURANCE FURNISHED BY
LESSOR ☐ LESSEE ☐
FULL COLLISION COVERAGE
YES ☐ NO ☐

TIME IN
TIME OUT
TOTAL TIME
MILEAGE IN
MILEAGE OUT
TOTAL MILES

CHARGES
MILES @
HOURS @
DAYS @
WEEKS @
HAND TRK. @
BLANKETS @
COLL. INS. @
FUEL @
TOTAL CHARGES
DEPOSIT AMT.
REFUND DUE AMT.
NET BALANCE DUE

No.

Total Time						Total Time						Total Time						Total Time						Total Time					
FRIDAY						THURSDAY						WEDNESDAY						TUESDAY						MONDAY					
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In

Total Time							
SATURDAY							
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In		

Week Ending ....

Total Time .... Rate .... Amt. ....

Name ....

Wages received from Parker-Hartford Corporation in full less proper deductions

Total Time					
SUNDAY					
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In

245-2

NO.

Monday Total Time						Tuesday Total Time						Wednesday Total Time						Thursday Total Time						Friday Total Time					
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In	Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In

SUNDAY Total Time					
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In

SATURDAY Total Time					
Night Out	Night In	Eve. Out	Noon In	Noon Out	Morn In

Week Ending ....

Total Time .... Rate .... Amt. ....

Name ....

Wages received from Parker Hartford Corporation in full less proper deductions

295-7

PAYROLL SUMMARY

EMPLOYEE			TOTAL HOURS	EARNINGS				DEDUCTIONS						NET AMOUNT	PERIOD ENDING	NUMBER		
				REGULAR	OVERTIME		GROSS PAY	F.I.C.A.	FEDERAL WH/TAX									
	1																	1
	2																	2
	3																	3
	4																	4
	5																	5
	6																	6
	7																	7
	8																	8
	9																	9
	10																	10
	11																	11
	12																	12
	13																	13
	14																	14
	15																	15
	16																	16
	17																	17
	18																	18
	19																	19
	20																	20

285

245-9

Chapter VIII

USING FORMULAS

CHAPTER VIII
Formulas

8-1 Definition

Mathematics uses formulas to indicate how values are to be found. A formula is a mathematical rule using symbols (usually letters) to represent numbers, numerals, and operation signs. The symbols used to represent numbers are called variables.

For example:

Look at: $a = b + c$

This means that "a" represents the number found by adding the numbers represented by "b" and "c".

Example 1: If $b = 3$ and $c = 7$, find a if $a = b + c$.

Solution:

a) $a = b + c$ Given

b) $a = 3 + 7$ Replacing the variables with the values they represent.

c) $a = 10$ Answer

When variables are replaced with the numbers they represent and the resulting value is found, we are evaluating the formula.

The replacement of variables with the values they represent is called substitution. (Step b in the preceding example.)

It should be noted that an expression such as "3a" means "3 multiplied by a." We will not write $3 \times a$ because the times sign, "x", could be mistaken for the variable x.

When evaluating an expression, such as, 3a, it is convenient to use parentheses in place of the variable. Thus, for $a = 2$, 3a becomes 3(2). This avoids the problem of deciding whether "3 2" means "3 x 2" or the number "32".

Example 2: Evaluate $F = 3a$ for F when $a = 5.6$.

Solution:

a) $F = 3a$ Given

b) $F = 3(5.6)$ Substitution. Note use of parentheses.

c) $F = 16.8$ Answer

Example 3: Evaluate $B = \frac{2a}{12c}$ for B when $a = 42$ and $c = 7$

Solution:

a) $B = \frac{2a}{12c}$ Given

b) $B = \frac{2(42)}{12(7)}$ Substitution

c) $B = \underline{1}$ Answer

8-1 EXERCISES: Evaluate the following if a = 3.2, b = 5.6, and c = .8.

1. $R = 5b = 5(\quad) =$
2. $E = a + c = (\quad) + (\quad) =$
3. $A = a + b + c = (\quad) + (\quad) + (\quad) =$
4. $S = 4ab = 4(\quad)(\quad) =$
5. $Q = abc = (\quad)(\quad)(\quad) =$
6. $N = \frac{a}{b} = \frac{(\quad)}{(\quad)} =$
7. $W = b - a = (\quad) - (\quad) =$
8. $H = \frac{ac}{b} = \frac{(\quad)(\quad)}{(\quad)} =$
9. $Y = \frac{a + b + c}{3} =$

FILMED FROM BEST AVAILABLE COPY

10. $V = \frac{1}{3}ac =$

11. $L = \frac{1}{2}a + c =$

12. $F = \frac{9}{5}a + 32 =$

13. $D = \frac{1}{3}ac + b =$

14. $B = \frac{2a}{c} + 1$

8-2 Order of Operations

When there is more than one operation to be performed in evaluating a formula, the following order is agreed upon:

(1) First, do multiplication and division in the order in which they occur from left to right.

(2) Second, add and subtract in the order written.

Example 1: Evaluate: 2 x 3 + 5 - 2 + 6 ÷ 2

Solution:

a) 2 x 3 + 5 - 2 + 6 ÷ 2	Given
b) 6 + 5 - 2 + 3	Multiply and divide, only.
c) 11 - 2 + 3 9 + 3 12 Answer	Add and subtract in the order written.

8-2 EXERCISES: Evaluate the following expressions:

1. 5 x 4 + 2 - 3 x 2 + 6
2. 10 + 3 - 1 x 5 + 10 ÷ 2 - 5
3. 16 ÷ 16 + 3 x 5 - 4 x 3 + 12 - 2 x 4
4. 21 - 6 x 2 - 2 + 9 ÷ 3
5. 10 - 2 x 1 + 4 ÷ 4 + 10 x 10 - 10
6. 9 + 4 x 2 + 1 - 8 ÷ 2 + 6
7. 18 - 8 ÷ 8 + 3 x 0 + 20 ÷ 1

8. $10 - 10 \times 1 + 20 \div 20 + 2 \div 1 - 3 \times 1 + 1$

9. $4 \times 7 - 3 \times 8 + 45 \div 9 - 9$

10. $14 \div 14 - 1 \times 0 + 10 \div 10 - 0 \times 20 + 100 \div 10$

Evaluate the following formulas letting $\underline{L = 13.4}$, $\underline{w = 5.3}$, $\underline{h = 7.2}$, and $\underline{b = 3.9}$.

11. $P = 2L + 2w$

12. $V = \frac{1}{3} Lwh$

13. $A = \frac{1}{2}bh$

14. $T = 2Lw + 2Lh + 2wh$

15. $S = Lw - w + L \div h$

16. $M = 4L - wb + h$

8-3 Raising to Powers

The numbers that are multiplied by each other to obtain a product are called factors. For example, $2 \times 3 = 6$. The 2 and 3 are factors of the product, 6.

When a product contains the same number as a factor two or more times, we are said to be raising the number to a power.

This is denoted in the following manner:

2^2, read "2 to the second power" or "2 squared", which means 2 x 2 or 4.

2^3, read "2 to the third power" or "2 cubed", which means 2 x 2 x 2 or 8.

2^4, read "2 to the fourth power", which means 2 x 2 x 2 x 2 or 16.

.
.
.
.
.

and so on.

The use of the TR key is convenient in raising to powers greater than 2 as you learned in Chapter V.

Example 1: Find 3^4.

Solution:

Your tape should look like this:

```
            3 x <
            3   =
            9 x T

            3   =
          2 7 x T

            3   =
Answer -> 8 1   T
```

That is:

3^4 means 3 x 3 x 3 x 3 or 81.

When raising decimals to a power be careful of the decimal point and keep all digits in the answer.

Example 2: Find 2.1^3.

Solution: Your tape should read:

```
             2.1 x <
             2.1   =
            4.41 x T

             2.1   =
Answer -> 9.2 6 1  T
```

Example 3: Find $\frac{1}{5}^{3}$

Solution:

a) $\frac{1}{5} = .2$

b) Thus $\frac{1}{5}^{3} = (.2)^3 = .2 \times .2 \times .2$

or .008 Answer

Example 4: If $a = 1.2$, and $b = 3.1$, find the value of $a^2 + b$.

Solution:

a)	$a^2 + b$	Given
b)	$(1.2)^2 + (3.1)$	Substitution
c)	$1.44 + 3.1$	Squaring
d)	4.54 Answer	

8-3 EXERCISES: Raise the following to the indicated powers:

1. 5^3
2. $.5^3$
3. $.05^3$
4. 50^3
5. $(41.5)^2$
6. 32^3
7. 19^2
8. 3.7^2
9. 7^4
10. $(8.1)^3$
11. $(8.01)^3$
12. 2^7
13. 2^{10}
14. 2^{20}
15. 29.5^2
16. $\frac{1}{4}^2$
17. 79.1^2
18. $\frac{1}{8}^3$
19. $\frac{5}{4}^4$
20. $(9.1)^4$

Note: In evaluating formulas and expressions, raise to the indicated powers before you multiply and/or divide.

Evaluate the following letting $a = 2.6$, $b = 3.7$, and $c = 4.8$.

21. $a^2 + b$

22. a^2b

23. b^3

24. a^2b^3

25. $a^2 + c^2$

26. $c^2 - b^2$

27. $6ab^2 + bc^2$

28. $a^4 + b^3 + c^2$

29. $4ab + 2c^2 - 3bc$

30. $\frac{a}{2} + b^2$

31. $\frac{ab^3}{c^2}$

32. $b - \frac{c^2}{3}$

33. $3a^2 - \frac{b}{c}$

34. $a^2 + b^2$

3-4 Parentheses

If there are parentheses in a formula that is being evaluated, find the value of the expression in each set of parentheses, first; then perform the necessary operations.

Example 1: Evaluate $P = 2(\mathbf{L} + \mathbf{W})$ for P if $\mathbf{L} = 7$ and $\mathbf{W} = 5$.

Solution:

a) $P = 2(L + W)$ Given

b) $P = 2(7 + 5)$ Substitution

c) $P = 2(12)$ Adding inside the parentheses, first.

d) $P = 24$ Answer Multiplication, 2 x 12.

8-4 EXERCISES A: Evaluate the following:

1. $A = 6(3 + 2)$

2. $P = 7(12 - 5)$

3. $R = 6 \times 3 + 5\ (2 \times 3 - 2)$

4. $V = 2 \times 3 \times 6\ (8 + 6)$

5. $B = (6 + 3)^2$

6. $W = \frac{6}{3} + 2\ (5 + 3) - 2 \times 3$

7. $T = 40 - 2\ (4 + 3)$

8. $G = \frac{1}{2}(10 - 2) + 5$

9. $I = 12 - \frac{1}{2}(8 + 2)$

10. $F = \frac{100}{2} - 6(2^3 - 6)$

Let us now summarize the steps to be taken in evaluating a formula:

(1) Replace the variables with the values they represent - Substitution.

(2) Raise to powers, first.

(3) Secondly, do multiplications and divisions in the order in which they occur from left to right.

(4) Then, add and subtract in the order in which they occur from left to right.

(5) Find any values inside a parentheses, first, using the above order of operations.

It should be noted that when the numerator or denominator of a fraction contains several variables or operations, they should be treated in the same manner as an expression within parentheses. That is, simplify numerators and denominators first.

Example 2: Evaluate $\frac{x + 2y}{2}$ when $x = 5$ and $y = 7$.

Solution:

a) $\frac{5 + 2(7)}{2}$ Substitution

b) $\frac{5 + 14}{2}$ Simplifying the numerator first.

or $\frac{19}{2}$

c) 9.5 Answer

8-4 EXERCISES B: If $x = 2.2$, $y = 5.4$, and $z = 7.9$, evaluate the following:

1. $2(x + y)$

2. $(2x + 3y) + z$

3. $2x + (3y + z)$

4. $5(x^2 + 2y)$

5. $y^2 - x^2$

6. $(y - x)^2$

7. $(y + x)(y - x)$

8. $z^2 + y^2$

9. $(z + y)^2$

10. $z^2 + 2zy + y^2$

11. $3.14\ y^2$

12. $3.14\ x^2z$

13. $6.28\ z^2 + 6.28\ zy$

14. $6.28\ z\ (z + y)$

15. $\frac{z}{2} - x$

16. $\frac{1}{2}x\ (y + z)$

17. $x\ y\ z$

18. $\frac{5}{9}\ (z - 32)$ (What is the meaning of your result here?)

19. $\frac{2}{5} y + 32$

20. $3.14 z^3$

21. $\frac{x + 2y}{z}$

22. $\frac{x^2 + 3}{y^2 - 2}$

8-5 Writing Formulas

To express mathematical and related principles as formulas, we write variables, numerals, and other accepted mathematical symbols in the required order to show the relationships between quantities. We often represent quantities by the first letter of a key word.

Example 1: Write as a formula:

The net price (n) is equal to the list price (l) minus the discount (d).

Solution:

(The net price)(is equal to)(the list price)(minus)(the discount.)

$n \qquad = \qquad l \qquad - \qquad d$

Note: Words or groups of words in the original sentence were replaced by variables, operating symbols, and the "equals sign." The word "is" or the words "is equal to" can always be replaced by the "=" symbol when writing formulas.

Example 2: Write as a formula:

The perimeter (P) of a rectangle is twice the sum of the length (L) and the width (w).

Solution:

(The perimeter of a rectangle) (is)
P =

(twice)(the sum of the Length and the width)
2 (L + w)

or $P = 2(L + w)$

Note the use of the parentheses here to indicate twice the sum of the length and the width

8-5 EXERCISES: Write each of the following as a formula:

1. The gross wage (G) equals the rate per hour(r) times the number of hours worked (h).

2. The total price (T) is equal to the total purchases (p) plus the sales tax (t).

3. The sale price (P) is the sum of the cost (c) plus the mark up(m).

4. The per cent of discount (p) is equal to the discount (d) divided by the list price (l).

5. The distance (d) is equal to the average rate (r) multiplied by the time (t).

6. The batting average (A) is equal to the number of hits(h) divided by the number of official times at bat (b).

7. The area of a rectangle (A) is equal to the product of the length (l) and the width (w).

8. The capital (C) of a business is the difference between the assets (A) and the liabilities (L).

9. The pitch of a roof (p) is equal to the rise (r) divided by the span (s).

10. The distance (d) a freely falling body drops is one-half the product of the acceleration due to gravity (g) and the square of the time falling (t).

11. The average of a set of numbers (A) is equal to the sum of the set of numbers (s) divided by the number of numbers in the set (n).

12. The marking period grade (G) is found by doubling the daily average (D), adding the final test mark (T) and dividing this result by 3.

13. The cutting speed (s) of a bandsaw in feet per minute is equal to pi (π) times the diameter (d) in feet times the number of revolutions per minute (R).

14. The time one travels (t) is found by dividing the distance (d) by the rate (r).

15. The product of the heavier weight (W) and the shorter distance (d) is equal to the product of the lighter weight (w) and the longer distance (D).

16. The number of gallons (g) in a container equals the number of cubic inches (c) divided by 231.

17. The simple interest (i) is equal to the principal (p) times the rate (r).

18. The number of volts (E) equals the number of amperes (I) times the number of ohms (R).

19. The number of single rolls of wallpaper (s) is equal to the number of square feet (f) divided by 36.

20. The net pay (n) is equal to the gross pay (g) minus the deductions (d).

8-6 Averages

8-6 A Arithmetic mean

Averages of many types are encountered in everyday life. You have already worked with one type of average, namely, the arithmetic mean. The arithmetic mean (m) of a set of numbers is the sum of the numbers in the set (S) divided by the number of numbers in the set (n). In formula form:

$$m = \frac{S}{n}$$

8-6 B Batting Average

In baseball we have several averages. One, the batting average (b) is found by dividing the total hits (h) by the number of official times at bat (n). In formula form stated:

$$b = \frac{h}{n}$$

These are ordinarily given to 3 decimal places.

8-6 C Earned Run Average

Another baseball average is referred to as the earned run average. The earned run average (E) is found by multiplying 9 by the number of earned runs given up by a pitcher (r) and dividing this result by the number of innings pitched (n). Stated as a formula this would be:

$$E = \frac{9r}{n}$$

Example 1: During one period in the 1966 baseball season, Drabowsky of the Orioles gave up 23 earned runs in 75 innings. What is his ERA(Earned Run Average)?

Solution:

a) $E = \frac{9r}{n}$ Given

b) $E = \frac{9(23)}{(75)}$ Substitution

c) $E = 2.76$ Answer

Note: ERA's are given to 2 decimal places.

8-6 D Miles Per Gallon

The average number of miles per gallon (mpg) is a selling feature of many small cars. The average number of miles per gallon (A) is the distance in miles (m) divided by the number of gallons of fuel (g) required for this distance. In formula form: $A = \frac{m}{g}$.

These are usually given to the nearest tenth.

Example 2: Before leaving on a trip, Bob's car registered 20,506 miles. At the end of the trip it registered 21,497 miles. The trip required 58 gallons of gasoline. What was his average miles per gallon?

Solution:

a) $m = 21{,}497 - 20{,}506 = 991$ Distance Traveled

b) $A = \frac{m}{g}$ Given

c) $A = \frac{991}{58}$ Substitution

d) $A = 17.1$ miles per gal. Answer

(Nearest tenth)

8-6 E Average Rate

The *average rate of speed* (r) is defined as distance (d) divided by time (t) or:

$$r = \frac{d}{t}$$

Example 3: Ray took 3½ hrs. to cover a distance of 140 miles. Find his average rate of speed.

Solution:

a) $r = \frac{d}{t}$ Given

b) $r = \frac{140}{3.5}$ Substitution

c) $r = 40.0$ m/h Answer

8-6 F Summary

You may have noticed by now that all of the above mentioned averages follow a basic pattern. In each case we *divided* one number by another. Whenever a mathematician compares the change in one variable to a corresponding change in another by division, he is said to be finding an *average rate of change*.

Look back to the exercises in section 8-5. Can you find other examples of an *average rate of change*?

8-6 EXERCISES

1. Find the arithmetic mean of the following set of numbers to two decimal places.

a)	b)	c)
238	253	267
276	273	266
203	248	221
207	281	237
209	201	271
301	257	249
298	244	211
289	276	236

2. At one point in the 1967 baseball season, Frank Robinson had 144 hits in 428 times at bat. What was his batting average at that time?

3. A pitcher allowed 55 earned runs in 108 innings. What was his ERA?

4. At the beginning of a trip, a car's speedometer registered 37,762 miles. At the end of the trip it registered 38,111 miles. The trip required 21.4 gal. of gasoline. What was the average miles per gallon? (Give answer to the nearest tenth.)

5. Claude drove 425 miles in 8½ hours. What was his average rate of speed? (Give answer to the nearest tenth.)

6. Find the arithmetic mean of the following set of numbers to three decimal places.

a)	b)	c)	d)
$1 \frac{1}{2}$	$2 \frac{5}{8}$	$3 \frac{5}{6}$	$3 \frac{3}{4}$
$2 \frac{1}{4}$	$3 \frac{7}{8}$	$4 \frac{1}{2}$	$2 \frac{4}{5}$
$3 \frac{1}{5}$	$1 \frac{1}{6}$	$2 \frac{3}{5}$	$4 \frac{1}{8}$
$4 \frac{2}{3}$	$1 \frac{1}{4}$	$1 \frac{1}{8}$	$3 \frac{3}{8}$
$2 \frac{3}{8}$	$2 \frac{7}{8}$	$4 \frac{1}{4}$	$2 \frac{7}{8}$

7. A rock falls 784 feet in 7 seconds. What is the average rate of speed at which the rock fell to the nearest tenth?

8. A batter had 243 hits in 759 times at bat. What is his batting average?

9. A motorcycle covered a distance of 313 miles and used 7.9 gal. of fuel. What was the average miles per gallon? (Nearest tenth)

10. A jet plane covers a distance of 1243 miles in 2.35 hours. What is its average rate of speed to the nearest tenth?

11. Paul has delivered a total of 469 newspapers in a one week period (7 days). What is the average number of papers he delivered each day?

12. A man earned a gross wage of $144.91 for 43 hours of work. What was his average rate of pay per hour?

8-7 Evaluating Formulas

In this section you are going to evaluate various formulas. Later on you will learn what some of these formulas are used for. Now, however, simply replace the variables with the values they represent and follow the order of operations listed in section 8-4.

Example 1: Given: $V = \frac{1}{3}Bh$

Find: V if $B = 62$ and $h = 7$.

Solution:

a)	$V = \frac{1}{3}Bh$	Given
b)	$V = \frac{1}{3}(62)(7)$	Substitution
c)	$V = \frac{434}{3}$	Multiplying
d)	$V = 144.67$ Answer	Dividing and rounding off to two decimal places.

8-7 EXERCISES:

Find V in each of the following. Let $\pi = 3.14$. Round off answers to nearest tenth.

(Example 1 is done for you as an illustration.)

	B	r	h	Formula	Substitution	V =
1.	75	—	7	$V = \frac{1}{3}Bh$	$= \frac{1}{3}(75)(7)$	= 175
2.	29.1	—	2.3	$V = \frac{1}{3}Bh$	=	=
3.	—	3.2	2.1	$V = \pi r^2 h$	=	=
4.	—	2.1	3.2	$V = \pi r^2 h$	=	=
5.	—	52	25	$V = \frac{1}{3}\pi r^2 h$	=	=
6.	—	25	7.7	$V = \frac{1}{3}\pi r^2 h$	=	=
7.	—	—	$\frac{1}{3}$	$V = h^3$	=	=
8.	—	$1\frac{1}{3}$	—	$V = r^3$	=	=

	B	r	h	Formula	Substitution	V =
9.	—	2.6	—	$V = \frac{4}{3}\pi r^3$	=	=
10.	—	212	—	$V = \frac{4}{3}\pi r^3$	=	=
11.	129.6	—	72.7	$V = \frac{1}{3}Bh$	=	=

Find T in each of the following:

Let $\pi = 3.14$

	P	r	h	Formula	Substitution	T =
12.	24.5	—	6.3	$T = Ph$	=	=
13.	97	—	36.3	$T = \frac{1}{2}Ph$	=	=
14.	—	2.56	4.12	$T = 2\pi rh$	=	=
15.	—	3.9	2.7	$T = 2\pi rh + 2\pi r^2$	=	=
16.	—	3.9	2.7	$T = 2\pi r(h+r)$	=	=
17.	—	5.78	—	$T = 4\pi r^2$	=	=
18.	—	19.3	24.9	$T = \pi rh$	=	=
19.	—	97	—	$T = 1.732r^2$	=	=
20.	—	47.8	—	$T = 6r^2$	=	=

8-8 Scientific Formulas

Commonly we use the Fahrenheit scale to measure temperature. On this scale, water freezes at 32° and boils at 212°. In scientific work the centigrade scale is used. On this scale, water freezes at 0° and boils at 100°.

To change Fahrenheit readings to centigrade use the formula: $C = \frac{5}{9}(F - 32)$, where F is the reading in Fahrenheit and C is the reading in centigrade.

Example 1: Change 70° Fahrenheit to centigrade.

Solution:

a) $C = \frac{5}{9}(F - 32)$ Given

b) $C = \frac{5}{9}(70 - 32)$ Substitution

c) $C = \frac{5}{9}(38)$ Evaluating inside

which means parentheses, first.

d) $C = \frac{5 \times 38}{9}$ This simply means we can

or multiply first, then

$C = \frac{5}{9} \times 38$ divide, or vice versa.

e) Method 1:

Set Automatic Total Lever "off"

Set 50 on key board

Depress $\boxed{x}$ key

Set 380 on key board

Depress (TR) key

Set 9 on the key board

Set Automatic Total Lever "on"

Depress $\boxed{\overset{\div}{T}}$ key.

```
              T

      5.0  x <
    3 8.0    =
1 9 0.0 0    :
        9    :
  2 1.1 1    T
        1    T
```

Method 2:

Automatic Total Lever "on"

Set 50000 (This gives sufficient number of decimal places in the answer.)

Depress Add and Dividend key

Set 9

Depress $\boxed{\overset{\div}{T}}$ key

Quotient .5555 is printed

Set quotient, 5555 on key board

Depress $\boxed{x}$ key

Set 38

```
                T

  5 0 0 0 0     +
  5.0 0 0 0     :
          9     :
   .5 5 5 5     T
          5     T

   .5 5 5 5  x  <
         3 8    =
2 1.1 0 9 0     T
```

Depress $\boxed{=}$ key

Answer, 21.1090° is printed.

To change centigrade to Fahrenheit use the formula:
$F = \frac{9}{5} C + 32$.

Example 2: Change 70° centigrade to Fahrenheit.

Solution:

a)	$F = \frac{9}{5} C + 32$	Given
b)	$F = \frac{9}{5} 70 + 32$	Substitution
c)	$F = 158°$	Answer

8-8 EXERCISES: Change the following Fahrenheit temperatures to centigrade: $C = \frac{5}{9} (F - 32)$

1. 40°
2. 160°
3. 200°
4. 100°
5. 50°
6. 98.6°
7. 78°
8. 320°
9. 1000°
10. 20° How do you interpret your result here?

Change the following centigrade readings to Fahrenheit:
$F = \frac{9}{5} C + 32$

11. 50°
12. 25°
13. 320°
14. 70°
15. 5°
16. 32°

17. $200°$

18. $58°$

19. $22°$

20. $212°$

8-9 Miscellaneous Formulas

Interest is the amount of money paid to use money. If you have money in a savings account, then the bank pays you interest for the use of that money. If you borrow money from a bank, then you pay the bank interest for the use of that money.

If I represents interest, p represents principal, r represents the rate of interest, and t represents the time in years, then: $I = prt$.

Example 1: Find the interest on \$50 for $2\frac{1}{2}$ years at $4\frac{1}{4}\%$.

Solution:

a) $I = prt$ Given

b) $I = (50)(.0425)(2.5)$ Substitution

c) $I = \$5.31$ Answer Multiplying

8-9 EXERCISES A: Use the formula $I = prt$ to complete the following table:

	Principal	Rate	Time	Interest
1.	\$ 850	4%	2 yr.	
2.	\$ 650	6%	3 yr.	
3.	\$ 45	$3\frac{1}{2}\%$	$1\frac{1}{2}$ yr.	
4.	\$ 2500	$6\frac{1}{2}\%$	5 yr.	
5.	\$ 125	12%	1 yr.	
6.	\$ 725	6%	1 yr. 6 mo.	
7.	\$ 80.50	$4\frac{1}{4}\%$	2 yr.	

	Principal	Rate	Time	Interest
8.	$12,500	$1\frac{1}{2}\%$	6 mo.	
9.	$ 435	$12\frac{1}{2}\%$	$2\frac{1}{2}$ yr.	
10.	$ 925	$7\frac{1}{4}\%$	3 yr. 3 mo.	

Sometimes the formula you are using does not have the variable representing the quantity you are looking for by itself. The "Law of Levers" is a good example to illustrate this idea.

Example 2: Using the formula $Wd = wD$, ("The Law of Levers"), find $\underline{d}$ when $\underline{W} = 200$ lbs., $\underline{w} = 100$ lbs., and $\underline{D} = 15$ ft.

Solution:

a) $Wd = wD$ Given

b) $(200)d = (100)(15)$ Substitution

c) $200d = 1500$ Multiplying

d) $d = 7.5$ ft. Answer. Dividing 1500 by 200. Why?

8-9 EXERCISES B: Complete the following table using the formula $Wd = wD$.

	W	d	w	D
11.		$2\frac{1}{2}$''	25 lbs.	9.25'
12.	600 lbs.	72"		2"
13.	75 kg.		27 kg.	37 cm.
14.	2562 lbs.	6"	200 lb.	
15.	520 lbs.	18"		8 ft.
16.		5"	37 lb.	10"

8-10 Review Exercises

Evaluate the following if a = 2.3, b = 14.1, and c = 7.7.

1. $a + 2b + 3c$

2. $5abc$

3. $6ab + 5bc - 2ac$

4. $(b-c)^2$

5. $b^2 - c^2$

6. $(a + b)^2$

7. a^2+b^2

8. $a^2 + 2ab + b^2$

9. $\frac{9}{2} (b + 3c)$

10. $3a + 2b (3c + 2)^2$

11. If $V = \frac{1}{3} Bh$, find V when $B = 72.7$ and $h = 3.1$.

12. Using the formula $V = \frac{4}{3} \pi r^3$, find V when $\pi = 3.14$ and $r = 7.6$.

13. If $d = rt$, find d when $r = 45$ and $t = 2.3$.

14. Given $P = 2(L + w)$, find P when $L = 37$ and $w = 23.5$.

15. Find the average of the following set of numbers: 215.60, 321.75, 198.65, 215.35. 315.98, 115.48, 201.40, and 193.65.

16. Using the formula of section 8-6, find Mark's term grade if his daily grades are 83, 79, 67, 95, 66, 83, and 76 and his final test mark was 81.

17. Convert a Fahrenheit temperature reading of 83° to centigrade using the formula in section 8-8.

18. Convert a centigrade reading of 110° to Fahrenheit using the formula of section 8-8.

19. Using the formula I = prt, find the interest on $1590 for 3 years at 5½%.

20. If $\underline{L = d^2n}$, find $\underline{L}$ when:

a) d = 25 and n = 4.

b) d = 50 and n = 4.

c) d = 25 and n = 8.

d) d = 25 and n = 2.

****

Some interesting arrangements: Number Patterns

I.

1 x 1 = 1
11 x 11 = 121
111 x 111 = 12321
1111 x 1111 = 1234321
11111 x 11111 = 123454321

II.

1 x 8 + 1 = 9
12 x 8 + 2 = 98
123 x 8 + 3 = 987
1234 x 8 + 4 = 9876
12345 x 8 + 5 = 98765

III. Find the pattern:

12345679 x 9
12345679 x 18
12345679 x 27

IV. Try this:

142857 x 2
142857 x 3
142857 x 4, **carry on up to 7 times.**

V. See if you can continue these:

(a) 7 x 143
7 x 286
7 x 429

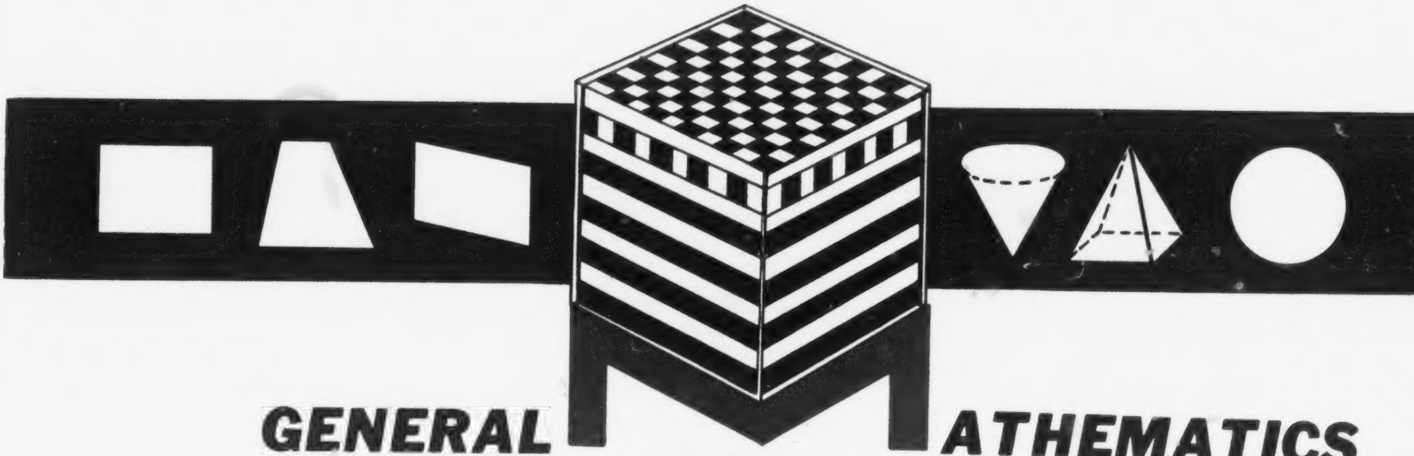
(b) 7 x 15873
7 x 31746
7 x 47619

(c) 6 x 7
66 x 67
666 x 667
6666 x 6667

(d) 333667 x 1113
33336667 x 11133

ED 069469

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY



GENERAL MATHEMATICS
machine calculator course

a text-workbook
BOOK 4

PART 1

1967
revised

SE 014 567

HARTFORD PUBLIC SCHOOLS PRODUCTION

FOREWARD

The machine calculator course, originally introduced for tenth grade mathematics students in September of 1966, has undergone an ambitious revision conducted by a mathematics research and development team under the ESEA, Title I, grant. Under the direction of G. William Saxton, Director of Secondary Education, Hartford Board of Education, the course materials have been developed by the following team members: Stephen J. Ucich, chairman of the team, department of mathematics, Hartford Public High School; Robert C. Mogensen, department of mathematics, Hartford Public High School; Marie M. Gubitz, department of mathematics, Weaver High School; William R. Johnson, department of mathematics, Windsor High School.

The course is intended to meet the needs of students who have exhibited a lack of problem-solving skills. Employing electric desk calculators to rid students of the frustration of computational drudgery, a new learning setting in which students can succeed has released them to read and analyze problems to a greater extent. These problems are directly related to the world of work that students may enter upon graduation.

The efforts of the first curriculum team in the summer of 1966 were directed toward the development of authentic, practical, problems obtained from business and industry in the greater Hartford area. With a year of valuable experience as a guide, the team has reorganized the course content from its originally exclusive problem-solving approach to a text-workbook format.

It was felt that students needed a basic review of arithmetic skills before they attempted to solve problems. In the first four chapters students learn how to use the machine while reviewing the basic operations with whole numbers, decimal numbers, fractions, and per cents. Next, a transitional chapter stresses the combining of these operations, so necessary for the solution of the detailed problems that follow.

In chapters 6 and 7 students first encounter problems that are within the framework of their own experience and are then gradually introduced to the more simple business oriented applications.

Chapters 8, 9, and 10 deal with the use of formulas and measurement of plane surfaces and solid figures, preparing students to extend this knowledge into the mathematics of everyday living and the more difficult practical problems from business and industry.

The intent of this order of course materials is to allow students to move toward independent achievment with greater confidence in solving problems that are new to them, thus creating the realistic atmosphere of the business world.

The objectives of the course are to be evaluated by pre-test and post-test scores on a mathematics achievment test designed by the team. The results should indicate the direction of possible future revisions to insure that educational offerings in mathematics are continually updated to meet the needs of our youth.

Looking ahead, the possibility of extending machine oriented mathematics courses to students in other grades certainly should not be discounted. Research in this field may reveal a need to offer the college bound student, as well as the student who will immediately enter the labor market, an opportunity to pursue mathematics for a deeper and more meaningful understanding of its principles.

Robert C Miles

Dr. Robert C. Miles
Assistant Superintendant
in Charge of Instruction

TABLE OF CONTENTS

Chapter XI Daily Math

Page

11-1 Installment Buying 341

11-1D Completing Invoices for Buying a Car on the Installment Plan 357

11-1F Installment Buying - Mortgages 362

11-2 Paying Bills 363

11-2A Paying Bills by Check 363

11-2B Writing Checks 364

11-2C Bank Statement for a Checking Account 370

11-3 Consumer Borrowing 374

11-3C Finding Bank Discount and Proceeds 376

11-3D Savings Account 377

11-3E Savings Account 378

11-3G Finding Interest and Amount 380

11-3H Finding Interest Using the 6% - 60 Day Method 381

11-3L Compound Interest 384

11-3N Compound Interest - Using Tables 388

11-4 United States Savings Bonds 391

11-4A Series E Savings Bonds 391

11-4B Series H Savings Bonds 391

11-4C Freedom Shares 392

11-5 Stocks 395

11-5B Brokerages Charges 396

11-6 Life Insurance 398

11-7 Automobile Insurance 407

Chapter XI - Continued

Page

11-8 Home Protection Insurance 416

11-9 Property Tax 422

11-10 Social Security 433

11-11 Income Taxes 439

11-12 Review 458

Chapter XII Practical Problems from Business

12-1 Introduction 468

12-2 Different Kinds of Lumber 468

12-3 Finding the Cost of Lumber (Price per Piece) 469

12-4 Finding the Cost of Lumber (Price per Lineal Foot) 474

12-5 Finding the Cost of Lumber (Price per Thousand Board Feet) 477

12-6 Finding the Cost of Plywood (Price per Sq. Ft.) 482

12-7 Other Products Sold by Lumber Companies 486

12-8 Installation of Glass and Related Aluminum Products 489

12-9 Shipment and Billing of Fractional Parts of an Order 496

12-10 Computing the Cost of Steel Chain 505

12-11 Yearly State Tax Collections 508

12-12 Comparing Monthly State Tax Collections 510

12-13 Unincorporated Business Tax 514

12-14 Reading an Electric Watt-Hour Meter 518

12-15 Find the Difference Between Two Meter Readings 521

12-16 Finding the Cost of Electricity 522

12-17 Computing Electric Bills By Using Formulas 526

12-18 Analysis of Rate Reduction 528

12-19 Computing Gas Bills 529

12-20 Computing Fuel Oil Bills 533

12-21 Review Exercises 537

Chapter 11

DAILY MATH

CHAPTER XI
Daily Math

11-1 Installment Buying

Buying on credit is popular with many American people. When you do not have cash to buy something that you need or want, it is often convenient to charge it. You may already have a CAP charge card which entitles you to charge items that you want to buy at stores enrolled in the Charge Account Plan. Opening a charge account requires that you are able to pay for your purchases and that you will pay for them. You must be earning enough money to pay for the things you buy.

When you buy on credit, you are usually expected to pay your bill within a month of the billing date. When you don't pay before a given due date, you must pay a service charge of 1½% per month on the amount due. When people buy an expensive, durable item, such as, furniture, a television set, appliances, such as a washer or refrigerator, or a car, or a home, they are usually unable to pay cash for them. By using the installment plan, it is possible to extend payments over a period of six months, a year, or several years. They can arrange to pay monthly payments, which they can afford.

When you buy something on the installment plan, you are usually expected to pay a cash down payment to show that you seriously intend to make the purchase. After the cash down payment is made, the balance of the purchase price can be paid in weekly or monthly payments until the item is wholly paid for. A finance charge or service charge is added to the unpaid balance to cover the interest on the amount due to the dealer and bookkeeping costs involved.

The unpaid balance plus the finance charge is called the time balance. The time balance is divided by the number of payments to be made to find the amount of each monthly payment.

Example: If you want to buy a color television set which costs $398.50, but you do not have enough to pay cash, you can arrange to buy it on an installment plan. If you can pay a down payment of $50. and pay the balance in 12 monthly payments, What will the monthly payments be?

Solution:

$398.50 cash price
- 50.00 down payment
$348.50 unpaid cash balance
12% of $348.50 = 41.82 finance charge
$390.32 time balance
($390.32 ÷ 12) = $32.52, monthly

You will receive the TV set when you pay the down payment, and you will be able to enjoy it while you are making payments. In this example, the finance charge is 12% of the unpaid balance. Finance charges vary for different dealers. Some dealers use a chart to determine the finance charges.

11-1 EXERCISES: Complete this chart to determine monthly installments for various balances over a 12 month period.

UNPAID CASH BALANCE	FINANCE CHARGE 12% of cash balance	TIME BALANCE unpaid cash balance plus finance charge	MONTHLY INSTALLMENT Time bal. ÷ 12
$100			
$150			
$200			
$250			
$300			
$350			

UNPAID CASH BALANCE	FINANCE CHARGE 12% of cash balance	TIME BALANCE unpaid cash balance plus finance charge	MONTHLY INSTALLMENT Time bal. ÷ 12
$400			
$450			
$500			
$550			
$600			
$650			
$700			
$750			
$800			
$850			
$900			
$950			
$1000			
$1050			
$1100			
$1150			
$1200			
$1250			
$1300			
$1350			
$1400			
$1450			
$1500			

11-1 EXERCISES A: Complete the following chart. Notice that the service charge varies

	PURCHASE PRICE	DOWN PAYMENT	UNPAID BALANCE (Purchase Price - Down Payment)	SERVICE CHARGE	TIME BALANCE (Unpaid balance + Service Charge)	NUMBER PAYMENTS	EACH PAYMENT
1.	$ 75	$ 15	______	5%	______	10	______
2.	$ 780	$100	______	6%	______	20	______
3.	$ 52	$ 5	______	10%	______	6	______
4.	$1215	$125	______	8%	______	25	______
5.	$ 249.50	$ 50	______	15%	______	12	______
6.	$1750.	$300	______	7%	______	48	______
7.	$6100	$1000	______	6½%	______	72	______
8.	$ 980	$150	______	7½%	______	24	______
9.	$ 179.98	$ 40	______	3½%	______	18	______
10.	$ 47.50	none	______	1½%	______	5	______
11.	$ 339	$ 75	______	12%	______	12	______
12.	$ 460	$ 80	______	18%	______	24	______

Use these charts to determine the time balance and monthly payments for various unpaid balances for 6 months, 12 months, 18 months, 24 months, 30 months and 36 months in the exercises following these charts:

Unpaid Cash Balance	6 MONTHS	
	Monthly Payment	Time Balance
100	$17.91	$107.46
110	19.58	117.48
120	21.25	127.50
130	22.96	137.76
140	24.73	148.38
150	26.50	159.00
160	28.26	169.56
170	30.03	180.18
180	31.80	190.80
190	33.56	201.36
200	35.33	211.98
210	37.10	222.60
220	38.86	233.16
230	40.63	243.78
240	42.40	254.40
250	44.16	264.96
260	45.93	275.58
270	47.70	286.20
280	49.46	296.76
290	51.23	307.38
300	53.00	318.00
310	54.76	328.56
320	56.53	339.18
330	58.30	349.80
340	60.06	360.36
350	61.83	370.98
360	63.60	381.60
370	65.36	392.16
380	67.13	402.78
390	68.90	413.40
400	70.66	423.96
410	72.43	434.58
420	74.20	445.20
430	75.96	455.76
440	77.73	466.38
450	79.50	477.00
460	81.26	487.56
470	83.03	498.18
480	84.80	508.80
490	86.56	519.36
500	88.33	529.98
510	90.10	540.60
520	91.86	551.16
530	93.63	561.78
540	95.40	572.40
550	97.16	582.96
560	98.93	593.58
570	100.70	604.20
580	$102.46	$614.76
590	104.23	625.38
600	106.00	636.00
610	107.76	646.56
620	109.53	657.18
630	111.30	667.80
640	113.06	678.36
650	114.83	688.98
660	116.60	699.60
670	118.36	710.16
680	120.13	720.78
690	121.90	731.40
700	123.66	741.96
710	125.43	752.58
720	127.20	763.20
730	128.96	773.76
740	130.73	784.38
750	132.50	795.00
760	134.26	805.56
770	136.03	816.18
780	137.80	826.80
790	139.56	837.36
800	141.33	847.98
820	144.86	869.16
840	148.40	890.40
860	151.93	911.58
880	155.46	932.76
900	159.00	954.00
920	162.53	975.18
940	166.06	996.36
960	169.60	1017.60
980	173.13	1038.78
1000	176.66	1059.96
1020	180.20	1081.20
1040	183.73	1102.38
1060	187.26	1123.56
1080	190.80	1144.80
1100	194.33	1165.98
1120	197.86	1187.16
1140	201.40	1208.40
1160	204.93	1229.58
1180	208.46	1250.76
1200	212.00	1272.00
1300	229.66	1377.96
1400	247.33	1483.98
1500	265.00	1590.00

Unpaid Cash Balance	12 MONTHS		Unpaid Cash Balance	12 MONTHS	
	Monthly Payment	Time Balance		Monthly Payment	Time Balance
100	$9.33	$111.96			
110	10.26	123.12	580	$54.13	$649.56
120	11.20	134.40	590	55.06	660.72
130	12.13	145.56	600	56.00	672.00
140	13.06	156.72	610	56.93	683.16
150	14.00	168.00	620	57.86	694.32
160	14.93	179.16	630	58.80	705.60
170	15.86	190.32	640	59.73	716.76
180	16.80	201.60	650	60.66	727.92
190	17.73	212.76	660	61.60	739.20
200	18.66	223.92	670	62.53	750.36
210	19.60	235.20	680	63.46	761.52
220	20.53	246.36	690	64.40	772.80
230	21.46	257.52	700	65.33	783.96
240	22.40	268.80	710	66.26	795.12
250	23.33	279.96	720	67.20	806.40
260	24.26	291.12	730	68.13	817.56
270	25.20	302.40	740	69.06	828.72
280	26.13	313.56	750	70.00	840.00
290	27.06	324.72	760	70.93	851.16
300	28.00	336.00	770	71.86	862.32
310	28.93	347.16	780	72.80	873.60
320	29.86	358.32	790	73.73	884.76
330	30.80	369.60	800	74.66	895.92
340	31.73	380.76	820	76.53	918.36
350	32.66	391.92	840	78.40	940.80
360	33.60	403.20	860	80.26	963.12
370	34.53	414.36	880	82.13	985.56
380	35.46	425.52	900	84.00	1008.00
390	36.40	436.80	920	85.86	1030.32
400	37.33	447.96	940	87.73	1052.76
410	38.26	459.12	960	89.60	1075.20
420	39.20	470.40	980	91.46	1097.52
430	40.13	481.56	1000	93.33	1119.96
440	41.06	492.72	1020	95.20	1142.40
450	42.00	504.00	1040	97.06	1164.72
460	42.93	515.16	1060	98.93	1187.16
470	43.86	526.32	1080	100.80	1209.60
480	44.80	537.60	1100	102.66	1231.92
490	45.73	548.76	1120	104.53	1254.36
500	46.66	559.92	1140	106.40	1276.80
510	47.60	571.20	1160	108.26	1299.12
520	48.53	582.36	1180	110.13	1321.56
530	49.46	593.52	1200	112.00	1344.00
540	50.40	604.80	1300	121.33	1455.96
550	51.33	615.96	1400	130.66	1567.92
560	52.26	627.12	1500	140.00	1680.00
570	53.20	638.40			

Unpaid Cash Balance	18 MONTHS Monthly Payment	Time Balance
100	$6.50	$118.62
110	7.25	130.50
120	7.86	141.48
130	8.52	153.36
140	9.17	165.06
150	9.83	176.94
160	10.48	188.64
170	11.14	200.52
180	11.80	212.40
190	12.45	224.10
200	13.11	235.98
210	13.76	247.68
220	14.42	259.56
230	15.07	271.26
240	15.73	283.14
250	16.38	294.84
260	17.04	306.72
270	17.70	318.60
280	18.35	330.30
290	19.01	342.18
300	19.66	353.88
310	20.32	365.76
320	20.97	377.46
330	21.63	389.34
340	22.28	401.04
350	22.94	412.92
360	23.60	424.80
370	24.25	436.50
380	24.91	448.38
390	25.56	460.08
400	26.22	471.96
410	26.87	483.66
420	27.53	495.54
430	28.18	507.24
440	28.84	519.12
450	29.50	531.00
460	30.15	542.70
470	30.81	554.58
480	31.46	566.28
490	32.12	578.16
500	32.77	589.86
510	33.43	601.74
520	34.08	613.44
530	34.74	625.32
540	35.40	637.20
550	36.05	648.90
560	36.71	660.78
570	37.36	672.48

Unpaid Cash Balance	18 MONTHS Monthly Payment	Time Balance
580	$38.02	$684.36
590	38.67	696.06
600	39.33	707.94
610	39.98	719.64
620	40.64	731.52
630	41.30	743.40
640	41.95	755.10
650	42.61	766.98
660	43.26	778.68
670	43.92	790.56
680	44.57	802.26
690	45.23	814.14
700	45.88	825.84
710	46.54	837.72
720	47.20	849.60
730	47.85	861.30
740	48.51	873.18
750	49.16	884.88
760	49.82	896.76
770	50.47	908.46
780	51.13	920.34
790	51.78	932.04
800	52.44	943.92
820	53.75	967.50
840	55.06	991.08
860	56.37	1014.66
880	57.68	1038.24
900	59.00	1062.00
920	60.31	1085.58
940	61.62	1109.16
960	62.93	1132.74
980	64.24	1156.32
1000	65.55	1179.90
1020	66.86	1203.48
1040	68.17	1227.06
1060	69.48	1250.64
1080	70.80	1274.40
1100	72.11	1297.98
1120	73.42	1321.56
1140	74.73	1345.14
1160	76.04	1368.72
1180	77.35	1392.30
1200	78.66	1415.88
1300	85.22	1533.96
1400	91.77	1651.86
1500	98.33	1769.94

Unpaid Cash Balance	24 MONTHS	
	Monthly Payment	Time Balance
100	$5.20	$124.80
110	5.72	137.28
120	6.25	150.00
130	6.77	162.48
140	7.23	173.52
150	7.75	186.00
160	8.26	198.24
170	8.78	210.72
180	9.30	223.20
190	9.81	235.44
200	10.33	247.92
210	10.85	260.40
220	11.36	272.64
230	11.88	285.12
240	12.40	297.60
250	12.91	309.84
260	13.43	322.32
270	13.95	334.80
280	14.46	347.04
290	14.98	359.52
300	15.50	372.00
310	16.01	384.24
320	16.53	396.72
330	17.05	409.20
340	17.56	421.44
350	18.08	433.92
360	18.60	446.40
370	19.11	458.64
380	19.63	471.12
390	20.15	483.60
400	20.66	495.84
410	21.18	508.32
420	21.70	520.80
430	22.21	533.04
440	22.73	545.52
450	23.25	558.00
460	23.76	570.24
470	24.28	582.72
480	24.80	595.20
490	25.31	607.44
500	25.83	619.92
510	26.35	632.40
520	26.86	644.64
530	27.38	657.12
540	27.90	669.60
550	28.41	681.84
560	28.93	694.32
570	29.45	706.80
580	$29.96	$719.04
590	30.48	731.52
600	31.00	744.00
610	31.51	756.24
620	32.03	768.72
630	32.55	781.20
640	33.06	793.44
650	33.58	805.92
660	34.10	818.40
670	34.61	830.64
680	35.13	843.12
690	35.65	855.60
700	36.16	867.84
710	36.68	880.32
720	37.20	892.80
730	37.71	905.04
740	38.23	917.52
750	38.75	930.00
760	39.26	942.24
770	39.78	954.72
780	40.30	967.20
790	40.81	979.44
800	41.33	991.92
820	42.36	1016.64
840	43.40	1041.60
860	44.43	1066.32
880	45.46	1091.04
900	46.50	1116.00
920	47.53	1140.72
940	48.56	1165.44
960	49.60	1190.40
980	50.63	1215.12
1000	51.66	1239.84
1020	52.70	1264.80
1040	53.73	1289.52
1060	54.76	1314.24
1080	55.80	1339.20
1100	56.83	1363.92
1120	57.86	1388.64
1140	58.90	1413.60
1160	59.93	1438.32
1180	60.96	1463.04
1200	62.00	1488.00
1300	64.58	1549.92
1400	72.33	1735.92
1500	77.50	1860.00

Unpaid Cash Balance	30 MONTHS		Unpaid Cash Balance	30 MONTHS	
	Monthly Payment	Time Balance		Monthly Payment	Time Balance
100	$4.37	$131.10	580	$25.38	$761.40
110	4.81	144.30	590	25.82	774.60
120	5.25	157.50	600	26.25	787.50
130	5.68	170.40	610	26.69	800.70
140	6.12	183.60	620	27.13	813.90
150	6.56	196.80	630	27.57	827.10
160	7.00	210.00	640	28.00	840.00
170	7.43	222.90	650	28.44	853.20
180	7.88	236.40	660	28.88	866.40
190	8.31	249.30	670	29.31	879.30
200	8.75	262.50	680	29.75	892.50
210	9.19	275.70	690	30.18	905.40
220	9.63	288.90	700	30.63	918.90
230	10.07	302.10	710	31.08	932.40
240	10.50	315.00	720	31.50	945.00
250	10.94	328.20	730	31.95	958.50
260	11.38	341.40	740	32.38	971.40
270	11.82	354.60	750	32.83	984.90
280	12.25	367.50	760	33.25	997.50
290	12.69	380.70	770	33.70	1011.00
300	13.13	393.90	780	34.13	1023.90
310	13.57	407.10	790	34.58	1037.40
320	14.00	420.00	800	35.00	1050.00
330	14.44	433.20	820	35.88	1076.40
340	14.88	446.40	840	36.75	1102.50
350	15.32	459.60	860	37.63	1128.90
360	15.75	472.50	880	38.50	1155.00
370	16.19	485.70	900	39.38	1181.40
380	16.63	498.90	920	40.25	1207.50
390	17.07	512.10	940	41.13	1233.90
400	17.50	525.00	960	42.00	1260.00
410	17.94	538.20	980	42.88	1286.40
420	18.38	551.40	1000	43.75	1312.50
430	18.82	564.60	1020	44.62	1338.60
440	19.25	577.50	1040	45.50	1365.00
450	19.69	590.70	1060	46.37	1391.10
460	20.13	603.90	1080	47.25	1417.50
470	20.57	617.10	1100	48.12	1443.60
480	21.00	630.00	1120	49.00	1470.00
490	21.44	643.20	1140	49.88	1496.40
500	21.88	656.40	1160	50.75	1522.50
510	22.32	669.60	1180	51.63	1548.90
520	22.76	682.80	1200	52.50	1575.00
530	23.20	696.00	1300	56.88	1706.40
540	23.63	708.90	1400	61.25	1837.50
550	24.07	722.10	1500	65.63	1968.90
560	24.50	735.00			
570	24.94	748.20			

Unpaid Cash Balance	36 MONTHS	
	Monthly Payment	Time Balance
100	$3.81	$137.16
110	4.20	151.20
120	4.58	164.88
130	4.96	178.56
140	5.34	192.24
150	5.72	205.92
160	6.11	219.96
170	6.49	233.64
180	6.87	247.32
190	7.25	261.00
200	7.64	275.04
210	8.02	288.72
220	8.40	302.40
230	8.78	316.08
240	9.17	330.12
250	9.54	343.44
260	9.93	357.48
270	10.31	371.16
280	10.70	385.20
290	11.08	398.88
300	11.46	412.56
310	11.84	426.24
320	12.22	439.92
330	12.60	453.60
340	12.99	467.64
350	13.37	481.32
360	13.75	495.00
370	14.13	508.63
380	14.52	522.72
390	14.90	536.40
400	15.28	550.08
410	15.66	563.76
420	16.04	577.44
430	16.42	591.12
440	16.81	605.16
450	17.19	618.84
460	17.57	632.52
470	17.95	646.20
480	18.34	660.24
490	18.72	673.92
500	19.10	687.60
510	19.48	701.28
520	19.86	714.96
530	20.24	728.64
540	20.63	742.68
550	21.01	756.36
560	21.39	770.04
570	21.77	783.72
580	$22.15	$797.40
590	22.53	811.08
600	22.92	825.12
610	23.30	838.80
620	23.68	852.48
630	24.06	866.16
640	24.45	880.20
650	24.83	893.88
660	25.21	907.56
670	25.59	921.24
680	25.97	934.92
690	26.35	948.60
700	26.74	962.64
710	27.12	976.32
720	27.50	990.00
730	27.88	1003.68
740	28.27	1017.72
750	28.65	1031.40
760	29.03	1045.08
770	29.41	1058.76
780	29.79	1072.44
790	30.17	1086.12
800	30.56	1100.16
820	31.32	1127.52
840	32.09	1155.24
860	32.85	1182.60
880	33.61	1209.96
900	34.38	1237.68
920	35.14	1265.04
940	35.90	1292.40
960	36.67	1320.12
980	37.43	1347.48
1000	38.20	1375.20
1020	38.96	1402.56
1040	39.72	1429.92
1060	40.48	1457.28
1080	41.25	1485.00
1100	42.01	1512.36
1120	42.77	1539.72
1140	43.53	1567.08
1160	44.30	1594.80
1180	45.06	1622.16
1200	45.83	1649.88
1300	49.64	1787.04
1400	53.47	1924.92
1500	57.28	2062.08

11-1 EXERCISES B: Use the tables on the preceding pages to find the time balance and the monthly payments in the following problems. Find monthly payment to nearest cent.

1. The cash price of a refrigerator is $300, and the down payment is $50. What is the time balance? If the payment period is 18 months, what is the monthly payment?

2. The cash price of an automatic washer is $240 and the down payment is $80. If the payment period is 30 months, what is the amount of the monthly payment? What is the time balance?

3. If in problem 2 you paid $80 down payment and then you paid $8.26 per month for 24 months, how much did you pay for the washer by paying on the installment plan? How much more than the cash price did you pay by buying on the installment plan?

4. A piano that is priced at $750 cash can be purchased for $25 down with $32 each month for 24 months. Find the difference between the cash price and the installment price.

5. An electric washer is sold for $23 down and $9.00 per month for one year. What is the installment price? If 9% discount from the installment price is allowed for cash, what is the cash price?

6. Mrs. Roberts bought a gas stove for $189.50. She paid $14 down and agreed to pay $1.95 a week until the stove was paid for. For how many weeks was she paying for the stove?

7. John May bought a TV set for $279.95. His down payment was $27.95. At 42 cents per day, how many days will it take him to complete his payments?

8. The living room sofa that the John's family wants to buy costs $229 cash or $271, if they pay $25 down and the rest in installments of $20.50 per month. How many payments must they make on the installment plan? How much more does the sofa cost on the installment plan than the cash price?

9. A radio is priced at $22 cash or $1 down and $4.00 per month for 6 months. What is the installment price of the radio? How much more is the installment price than the cash price? What rate of service charge is paid for using the installment plan? (Divide difference in price by cash price.)

10. Carol's mother bought the following items:

1) a sewing machine	$140.00
2) vacuum cleaner	$ 65.50
3) toaster	$ 15.95

She paid for these items over a period of 6 months. How much is the monthly installment for the total bill if there was no down payment?

11. You have decided to refurnish your living room. You have selected a rug which costs $215, a chair which costs $199., and a fabric covered sofa which costs $295. You are able to pay $150 down payment and finance the balance. The cash price must include a 3½% sales tax. The finance charges are at the rate of 8% per year on the unpaid balance. You plan to pay off the time balance in 2½ years (30 months).

Fill out the following "Retail Installment Contract."

ORIGINAL

RETAIL INSTALMENT CONTRACT

0134863
Contract Number

The undersigned seller hereby sells, and the undersigned buyer hereby purchases, subject to the terms and conditions set forth below and upon the reverse side hereof, the property described below or in schedule attached hereto, delivery and acceptance of which in good order is hereby acknowledged by buyer, viz.:

New or Used	Year	Description of Property	Serial or Compressor No.	Model or Cabinet No.
(1)				
(2)				
(3)				

For a **TIME SALE PRICE** computed as follows:

(1) Cash Price .... $______
(2) Down Payment ($______ (Net Trade-in) $______ (Cash)).......... $______
(3) Unpaid Balance of Cash Price (Subtract Item 2 from Item 1) $______
* (4a) Charge for Creditor Insurance on Life of Buyer, if any.... $______
(4b) Charge for Insurance on the Property, if any............ $______
(5) Filing Fee .... $______
(6) Principal Balance (Add Items 3, 4a, 4b and 5)........... $______
(7) Finance Charge .... $______
(8) Time Balance (Add Items 6 and 7) .... $______
(9) Total Time Sale Price (Add Items 2 and 8)............... $______

Buyer agrees to pay the Time Balance (Item 8) at the seller's or assignee's office in ______ consecutive instalments of $______ commencing ______, 19____, and on the same day of each successive month, or as indicated in space below.

The monthly payments due on this contract will be combined with the monthly payments that may be due on any unpaid prior contract(s) entered into by the buyer and seller hereunder, at the election of the buyer as indicated below:

☐ Combine with Open Prior Contract

☐ Do not combine with Open Prior Contract

If the number of instalments due under this contract exceeds the number of instalments still remaining unpaid on the earlier contract or contracts, the latter will be extended and the instalments adjusted, without charge, to conform to the schedule of this contract. If requested, the combination will be made without changing the instalment amounts due under the respective contracts.

* **According to terms and conditions set forth in policy or certificate of insurance issued by the insurer as checked below. If the insurance becomes effective, the term thereof shall commence on the date of this contract and continue until the date, but not later than the 15th ( ) day after the date provided above for payment of the final instalment hereunder, on which the unpaid balance of the obligation hereunder is or becomes paid in full, unless the insurance is automatically terminated on an earlier date in certain other events. Reference is hereby made to the further statement of such insurance, including the further statement concerning the below designated maximum amounts of insurance, contained on the buyer's copy of contract and hereby incorporated in this item.**
Buyer Proposed For Life Insurance: The person whose name appears on line A below (co-buyer, if any, on line B, when buyer is a corporation or partnership).

☐ **The Prudential Insurance Company of America, Newark, New Jersey, under its Group Policy No. GL-360. Under said group policy, maximum amount of insurance under this contract is $7,500 and maximum aggregate amount of insurance under this and any other instalment contract of the buyer is $15,000.**

BUYER'S DECLARATION OF GOOD HEALTH (Applicable Where a Charge Has Been Authorized in 4a Above and Insurance Under Prudential Group Policy GL-360 is Proposed) — I, the buyer proposed for life insurance, in order to induce Prudential to effect such insurance, do hereby declare that to the best of my knowledge and belief I am now in good health. I hereby authorize any physician or hospital to disclose to Prudential all information concerning my medical history prior to the date of this contract.

☐ ______
(If Other Policy, Name Insurer)

______
(Home Office Address)

Under policy of above designated insurer, maximum amount of insurance under this contract is $______, and maximum aggregate amount of insurance under this and any other instalment contract of the buyer is $______.

12. Use the personal loan application for the Connecticut Bank and Trust Company (page 355)

Norma and Cyril Patterson are a newly wed couple. They have just rented an apartment at 256 Prospect Avenue, Hartford. They have been shopping for furniture which they plan to buy on the installment plan. They have selected the French Provincial 4 Pc. bedroom set for $346, the Contemporary sofa for $196. and the 8 piece dining room set for $358, listed in this advertisement.

French Provincial 4-Pc. Bedroom

Orig. 459.00 **346.**

Beautiful block front design, fruitwood finish. Includes the 66" triple dresser, mirror, large chest on chest, full or queen size bed. 1 only.

★

Italian Prov. 8-Pc. Dining Room

Orig. 479.00 **358.**

Handsome fruitwood finish on cherry. Includes the 60" breakfront cabinet, oval extension table, 2 arm, 4 side chairs. 1 only.

★

Stratorester Recliner Chair

Orig. 119.00 **77.**

Smart off-the-floor design, adjusts to all positions including TV. Super soft vinyl plastic in gold. 2 only.

★

Contemporary 84" Sofa

Orig. 344.50 **196.**

By famous Flair. Smart, slimline design, foam rubber cushions, walnut finish. Thick, burnt orange and brown tweed. 1 only.

(a) What is the total cost of these three items including the $3\frac{1}{2}\%$ sales tax?

(b) If Cyril and Norma Patterson can pay a down payment of $100, what will be the unpaid balance?

(c) Since the finance charge is 12% of the unpaid balance find the time balance and the monthly payment if they are able to finance it for 36 months.

They plan to finance this purchase through a loan from the Connecticut Bank and Trust Company. Use the following personal information to fill out the loan application. Cyril is employed by Olivetta Underwood Corporation in Hartford. He earns $625 per month. Norma is employed by All-State Insurance Company, Bishop Corner, West Hartford. She earns $425 per month. Cyril has a life insurance policy with face value of $10,000 with Travelers, a checking account with CBT and a savings account with Society for Savings. They own a 1966 Pontiac with monthly payments of $83.56 to GMAC. Complete the Retail Installment Contract for this problem below.

THE CONNECTICUT BANK AND TRUST COMPANY

APPLICATION FOR PERSONAL LOAN

This loan, if granted, will be protected by life insurance to the extent provided under the Bank's Customer Group Life Insurance Policy. If the Borrower should die before the loan is paid, the balance of the loan will be paid out of the proceeds of such life insurance up to the limits of said life insurance policy and if so paid, the estate of the Borrower will be released from further liability. This protection is furnished for the Borrower indicated below, but does not protect the Co-makers or Endorsers.

PLEASE ANSWER ALL QUESTIONS Date ....

I hereby make application for a loan of .... $

Purpose of loan ....

Name .... Age ....

Home Address .... City .... Phone No. ....

Married or Single .... Wife's Name .... Number of Dependents ....

Employed by .... for .... Years

Position Occupied .... Phone No. ....

State whether Salary, Wages or Commission .... Amt. per Wk. $

If any other income, source .... Amt. per Wk. $

Previous Employment .... Position .... How Long ....

Where is your Checking Account? .... Savings Account? ....

.... Safe Deposit Box? ....

Amount of Life Insurance .... Amount borrowed on Insurance .... Rent paid per Month ....

Have you any other loans? And are you making any installment payments to banks, loan companies, installment or finance companies, credit unions or others? If so, give details below. *(IF NONE, PLEASE STATE "NONE")*

	Original Amount	Unpaid Balance	AMOUNT PAID WEEKLY OR MONTHLY
....	$	$	$
....	$	$	$
....	$	$	$
....	$	$	$
....	$	$	$
....	$	$	$
....	$	$	$

What is the total of all outstanding debts, including any budget accounts .... $

Do you own an automobile? .... Make .... Year ....

Location and description of Real Estate Owned ....

11-1 EXERCISES C:

1. The unpaid cash balance on the purchase of an automobile is $1500. If the payment period is 36 months, how much must you pay per month? What is the time balance? How much is the finance charge?

2. The cash price of a new car is $3200. You have $250. down payment. In addition, you have your old car for which the dealer will give you $650 trade allowance. If you finance the balance that you owe for a period of 30 months, what will your monthly payment be? Finance charge is 12% of unpaid balance.

3. How much did you actually pay for the car in problem 2?

Include Down payment ______
Trade-in allowance ______
Time balance + ______
Installment cost ______
Cash price - ______

Amount lost by not paying cash.

4. Paul Weber bought a 1965 Volkswagen for $1300. He received a trade allowance of $100 for his 1955 Ford. What would his monthly payments be if he paid for the car over a 2 year period? Finance charge is 12% of unpaid balance.

11-1 D Completing Invoices for Buying a Car on the Installment Plan

a) When you see an automobile in a car dealer's show room, the car has a certain price tag on it. This price is the list price of the car. This price does not include certain extra items that you may want, such as, power steering, power brakes, automatic transmission, car radio, white wall tires, etc. The cost of these extras must be added to the list price. In addition, the sales tax and registration fee must be added on. The total of all these, list price plus extras, amounts to the actual cost of the car.

b) You usually make a cash down payment (deposit) and you might also have a used car which you want to trade in. The amount that your used car is worth, together with your deposit, represents the down payment that you are putting into the new car.

c) If you subtract (b) from (a), this amount of money is the cash difference between what the car will cost you, and the amount you are putting into the new car.

d) Since you are buying on the installment plan, use the tables on pages 345 through 350 to find the monthly payments based on the cash difference and the number of months over which you will be paying for the car.

11-1 EXERCISES E:

Use the form at the bottom of this page for the following problem:

1. Make out an invoice for a Plymouth (Fury II) from J.R. Johnson's; the list price of the car is $3419. Extras include power sterring at $120, undercoating $23, radio $87. The registration fee is $13. The cash deposit is $375 and the trade-in allowance on the previous car is $1100. The Connecticut sales tax is 3½% of the cost. Determine the monthly payments for 3 years, if the finance charge is 15% of the cash difference.

1. Price of Car		
2. Extras		
3.		
4.		
5.		
6. List price plus extras		(Cost of car with extras)
7. Sales tax		(3½% of cost of car)
8. Title fee and Registration		
9. Total Price		(Total cost inc. sales tax and title fee and registration)
SETTLEMENT		
10. Cash Deposit		
11. Cash on Delivery		
12. Used Car		
13. Total Allowance		(Cash payment and other allowances)
14. Cash difference		(Total price - total allowance
15. Finance Charge		12% of cash difference
16. Time Balance		cash difference + finance charge
17. Time ______ months		
18. Monthly Payments		time balance ÷ no. months

11-1 EXERCISES E: Use the form at the bottom of this page for the following problem:

2. The list price of a car is $2600. Extras include power brakes $68, power steering $130, car radio $108. The sales tax is $3\frac{1}{2}\%$ of the cost. The title fee and registration is $13. The cash deposit is $500 and the trade-in allowance on the old car is $1000. Use 12% finance charge to find time balance and monthly payments for an 18 month period.

1. Price of Car		
2. Extras		
3.		
4.		
5.		
6. List price plus extras		(Cost of car with extras)
7. Sales tax		($3\frac{1}{2}\%$ of cost of car)
8. Title fee and Registration		
9. Total Price		(Total cost inc. sales tax and title fee and registration
SETTLEMENT		
10. Cash Deposit		
11. Cash on Delivery		
12. Used Car		
13. Total Allowance		(Cash payment and other allowances)
14. Cash difference		(Total price - total allowances)
15. Finance Charge		
16. Time Balance		(Cash difference + finance charge)
17. Time ______ months		
18. Monthly Payments		(Time balance ÷ no. months)

11-1 EXERCISES E: Use the form at the bottom of this page for the following problem:

3. A car lists for $2000. Extras include undercoating $23, radio $70, and polish & wax $15. Registration fee is $13. The trade-in value of the old car is $540 and the cash down payment is $200. The sales tax is 3½% of the cost. Find the monthly payments for a two year period.

1. Price of Car		
2. Extras		
3.		
4.		
5.		
6. List Price plus extras		(Cost of car with extras)
7. Sales tax		(3½% of cost of car)
8. Title fee and Registration		
9. Total Price		(Total cost in. sales tax and title fee and registration)
SETTLEMENT		
10. Cash Deposit		
11. Cash on Delivery		
12. Used Car		
13. Total Allowance		(Cash payment and other allowances)
14. Cash difference		(Total price - total allowance)
15. Finance Charge		12% of cash difference
16. Time Balance		cash difference + finance charge
17. Time ______ months		
18. Monthly Payments		time balance ÷ no. months

11-1 **EXERCISES** E: Use the form at the bottom of this page for the following problem:

4. The list price of a car is $3400. Extras include power brakes $70, power steering $130, AM-FM radio $78. Registration fee is $13. Sales tax is 3½%. Cash deposit is $340, and the trade-in allowance is $800. Find the monthly payments for 30 months. How much more than the cash price is the installment price?

1. Price of Car		
2. Extras		
3.		
4.		
5.		
6. List price plus extras		(Cost of car with extras)
7. Sales tax		(3½% of cost of car)
8. Title fee and Registration		
9. Total Price		(Total cost inc. sales tax and title fee and registration)
SETTLEMENT		
10. Cash Deposit		
11. Cash on Delivery		
12. Used Car		
13. Total Allowance		(Cash payment and other allowances)
14. Cash difference		(Total price - total allowances)
15. Finance Charge		**12% of cash difference**
16. Time Balance		cash difference + finance charge
17. Time ______ months		
18. Monthly Payments		time balance no. months

11-1F Installment Buying - Mortgages

Houses are usually purchased on an installment plan. The buyer pays a down payment, then signs a mortgage for the unpaid balance. The **mortgage** is a statement that the buyer promises to pay the unpaid balance. In most cases this arrangement is handled by a bank. The bank pays the seller the amount of the unpaid balance and the buyer makes his monthly payments to the bank which holds the mortgage.

11-1 EXERCISES F:

1. The Dean family bought a house for $12,000. They paid $3000 down payment and signed a **mortgage** to pay the balance in 20 years at $66.56 per month. Find the total payments for 20 years. How much more than the cash price was the installment price?

2. Mr. Becker bought a house for $18,250 and made a down payment of 20% of the cost. What was the amount of the mortgage?

3. Tom's father earns $450 a month. He wishes to buy a new house. If he should not spend more than 2½ times his annual salary, what is the top price he can afford to pay for his house?

4. If Mr. Smith paid $3500 down payment on a house costing $15,490, how much does he need to borrow on a mortgage?

5. Mr. Johnson bought a house for $13,500. He paid 25% down and received a mortgage for the balance. If he pays 5½% interest on the mortgage, how much interest will he pay per year? How much interest will he pay for 20 years on the unpaid balance?

11-2 Paying Bills

There are many ways in which bills can be paid. There are advantages and disadvantages in the different methods you choose.

1) Paying cash is a simple way to pay bills. However, you have to spend the time and transportation costs of going to the company to whom you owe the money. You may also run the risk of losing the money.

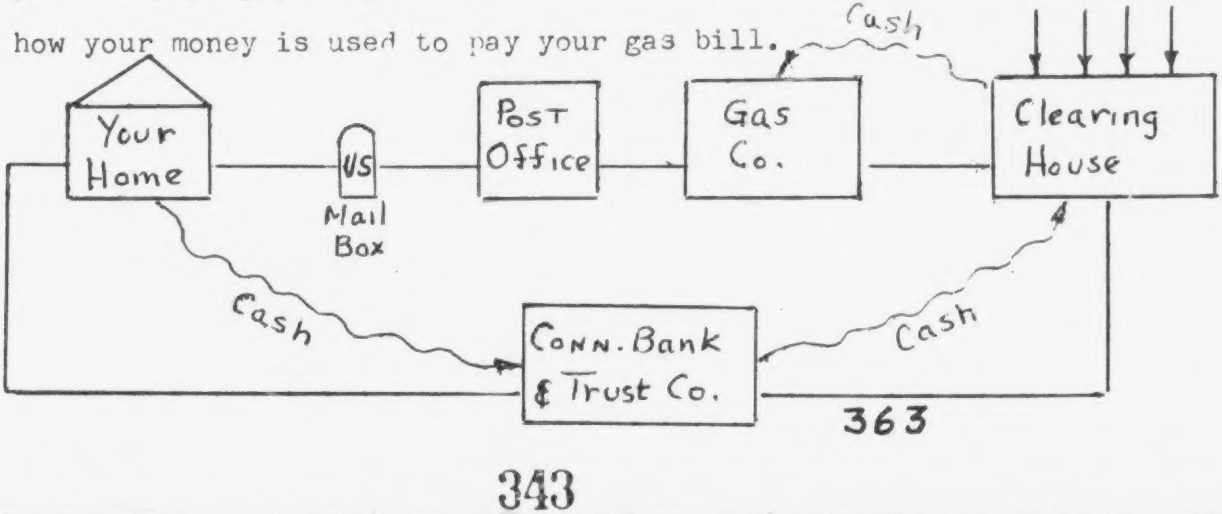
2) You could mail the bill and put the cash in the envelope.

3) You could go to the post office and make out a money order for the amount of the bill. There is a small charge that you must pay for the money order. The actual amount of charge depends upon the amount of the bill.

4) You could pay the bill by a personal check. You may start a checking account in most banks, simply by depositing some money in the bank. Then you are given a book of checks. When you write a check for payment of a bill, your check is as good as the money that you have deposited in the bank. There is usually a service charge for each check that you write to cover the cost of the bookkeeping involved.

11-2A Paying Bills by Check

You have a checking account in the Conn. Bank & Trust Co. and you are paying your gas bill. Let's see where your check goes, and how your money is used to pay your gas bill.



Our country is divided into sections, each section having its own clearing house. All checks in a section eventually are sent here.

After the Gas Co. marks your account paid, your check is sent to the clearing house. The Gas Co. then receives the cash in the amount of your check. This cash came from the Conn. Bank & Trust Co. where you deposited it. When the bank receives your check, then send the cash for this check to the clearing house. The bank then subtracts the amount of your check from your account. It then sends you your cancelled check for your own record. The cancelled check is a receipt of payment - you should keep it for proof of payment.

Stop and think of all the people who have handled your check and cash.

11-2B Writing Checks

READ this before writing the check:

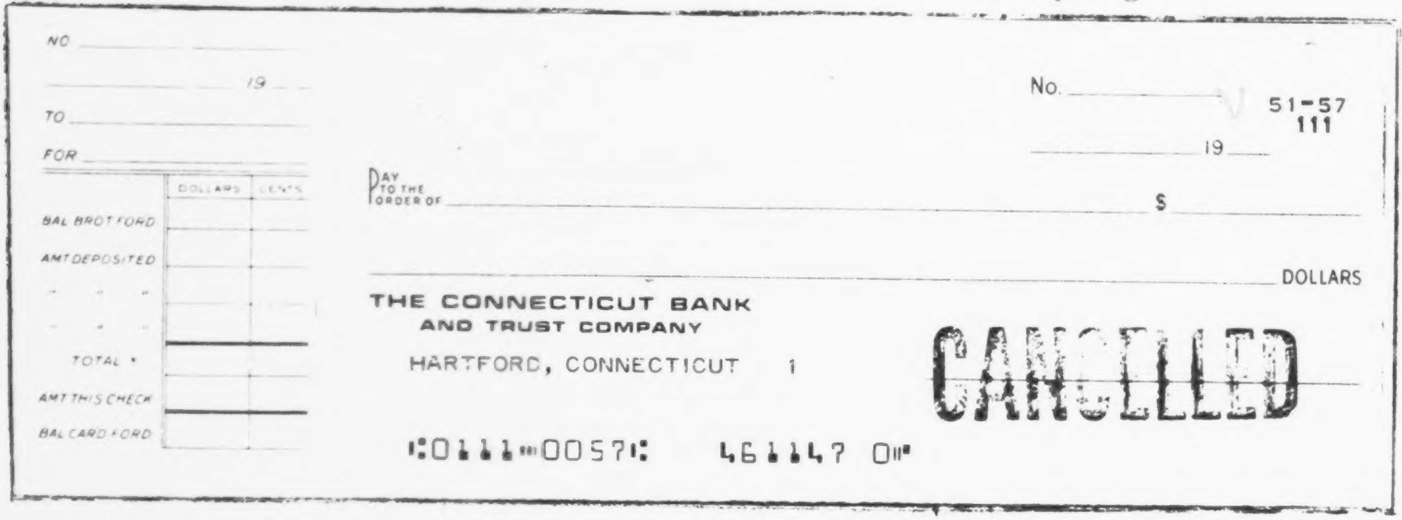
You are starting a checking account by depositing $100 in the Conn. Bank & Trust Co. Write $100 in the space marked TOTAL on the stub. This is your first check so write the number 1 on both the stub and the check. Put in today's date. Let's say you are paying your gas bill amounting to $21.17. On the check, write "Hartford Gas Co.", then the amount $21.17. Now write $21.17 in words on the line marked DOLLARS. It should look like this: Twenty-one and 17/100 DOLLARS. Now sign the check. The check is not good without your signature.

11-2B EXERCISES

Now complete your stub to keep a record of how you spent your money. Add total AMT. DEPOSITED to BAL. BROT FOR. to find total.

Opposite "AMT THIS CHECK" write $21.17. Subtract this from your total and write the difference opposite BAL. CAR'D FOR'D.

1) Transfer this balance to the next stub on the following page.



NO ____________

____________ 19 ___

TO ____________

FOR ____________

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

No. ____________ 51-57 / 111

____________ 19 ___

PAY TO THE ORDER OF ____________ $ ______

____________ DOLLARS

THE CONNECTICUT BANK AND TRUST COMPANY

HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑉0057⑆ 461147 0⑈

Use the forms on the following pages to write checks for the following:

Problem				
2 -	Check #2	Cash	$10.00	
3 -	Check #3	Electric Light Company	$17.47	
4 -	Check #4	Telephone Company	$ 6.67	
5 -	Deposit			$50.00
6 -	Check #5	G. Fox and Company	$12.56	
7 -	Check #6	Morris Seigal, Plumber	$ 9.50	
8 -	Check #7	Reno Wallpaper Company	$31.20	
9 -	Deposit			$34.32
10 -	Check #8	Dr. Donald Wish	$17.00	
11 -	Check #9	Fuller Brush Company	$ 6.89	

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CAR'D FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO.

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CAR'D FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO.

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CAR'D FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO.

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CAR'D FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

NO

19

TO

FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

No.

51-57
111

19

PAY TO THE ORDER OF $

DOLLARS

THE CONNECTICUT BANK
AND TRUST COMPANY
HARTFORD, CONNECTICUT 1

CANCELLED

⑆0111⑈0057⑆ 461147 0⑈

347 367

Use forms on this page and the next to complete the stubs for the following:

	Balance	$212.61		
12	Check #51	Mortgage payment	$109.73	
13	Check #52	Hartford Electric Light	$ 14.09	
14	Check #53	Home Service Fuel Co.	$ 34.17	
15	Deposit			$ 85.16
16	Check #54	GMAC payment	$ 95.77	
17	Check #55	A.C. Peterson Farms	$ 5.76	
18	Check #56	Kennedy's Clothing	$ 20.78	
19	Deposit			$115.00
20	Check #57	Capitol City Lumber Co.	$ 18.38	
21	Check #58	Mutual Ins. Co.	$35.94	
22	Check #59	Savitt Jeweler	$ 8.94	
23	Check #60	U.S. Treasury Dept.	$ 46.06	
24	Deposit			$ 92.48
25	Check #61	Consumer Sales	$ 39.95	
26	Check #62	Cash	$ 20.00	

NO ______
______ 19 ___
TO ______
FOR ______

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO ______
______ 19 ___
TO ______
FOR ______

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO ______
______ 19 ___
TO ______
FOR ______

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT TH[illegible]CK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO. ____

____ 19 __

TO ____

FOR ____

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

11-2C Bank Statement for a Checking Account

Determine the balance for this statement:

BANK STATEMENT FOR A CHECKING ACCOUNT:

Determine the balance for this statement:

FORM 720

STATEMENT FROM

THE CONNECTICUT BANK AND TRUST COMPANY

DATE OF LAST STATEMENT	NUMBER OF DEPOSITS-CREDITS	NUMBER OF CHECKS-DEBITS	DATE OF THIS STATEMENT
3-03-66	1	14	4-04-66

YOUR BALANCE AS SHOWN ON PREVIOUS STATEMENT	+	TOTAL AMOUNT OF DEPOSITS-OTHER CREDITS	−	TOTAL AMOUNT OF CHECKS-OTHER DEBITS	−	SERVICE CHARGE	=	BALANCE AS OF THIS STATEMENT DATE
596 01								405 05

Print your name and address:

Account No.
PAGE
493072-4

Hartford

NOTIFY US OF ANY CHANGE OF ADDRESS

CHECKS	CODE	CHECKS	CODE	DEPOSITS	CODE	DATE	BALANCE
						3-03-66	596 01
3000						3-10-66	
1476						3-11-66	
1500		15 00				3-12-66	
17 00		125 00				3-14-66	
2256						3-15-66	
1194						3-21-66	
1200						3-31-66	
9 33		5000				4-01-66	
122 00						4-01-66	
12 00		3675		308 18		4-04-66	
80	4					4-04-66	410 05

CODES:
1 · DEBIT MEMO
2 · ERROR CORRECTED
3 · LIST OF CHECKS
4 · SERVICE CHARGE
5 · REVERSE ENTRY
OD · OVERDRAFT

BANK STATEMENT FOR CHECKING ACCOUNT:

Determine the balance for this statement:

FORM 720

STATEMENT FROM
THE CONNECTICUT BANK
AND TRUST COMPANY

DATE OF LAST STATEMENT	NUMBER OF DEPOSITS-CREDITS	NUMBER OF CHECKS-DEBITS	DATE OF THIS STATEMENT
4-04-66	1	11	4-29-66

YOUR BALANCE AS SHOWN ON PREVIOUS STATEMENT	+	TOTAL AMOUNT OF DEPOSITS-OTHER CREDITS	−	TOTAL AMOUNT OF CHECKS-OTHER DEBITS	−	SERVICE CHARGE	=	BALANCE AS OF THIS STATEMENT DATE

Print your name and address:

Account No.
PAGE
493072-4

Hartford

NOTIFY US OF ANY CHANGE OF ADDRESS

CHECKS	CODE	CHECKS	CODE	DEPOSITS	CODE	DATE	BALANCE
						4-04-66	410 05
6 00						4-05-66	
70 00						4-11-66	
15 00		25 00				4-12-66	
8 98		16 60				4-13-66	
55 00						4-14-66	
20 00						4-18-66	
				260 87		4-19-66	
11 94						4-20-66	
5 00		30 00				4-28-66	
1 38	4					4-29-66	

CODES:
1 - DEBIT MEMO
2 - ERROR CORRECTED
3 - LIST OF CHECKS
4 - SERVICE CHARGE
5 - REVERSE ENTRY
OD - OVERDRAFT

BANK STATEMENT FOR A CHECKING ACCOUNT:

Determine the balance for this statement:

FORM 720

STATEMENT FROM

THE CONNECTICUT BANK AND TRUST COMPANY

DATE OF LAST STATEMENT	NUMBER OF DEPOSITS-CREDITS	NUMBER OF CHECKS-DEBITS	DATE OF THIS STATEMENT
4-29-66	2	12	5-29-66

YOUR BALANCE AS SHOWN ON PREVIOUS STATEMENT	+	TOTAL AMOUNT OF DEPOSITS-OTHER CREDITS	−	TOTAL AMOUNT OF CHECKS-OTHER DEBITS	−	SERVICE CHARGE	=	BALANCE AS OF THIS STATEMENT DATE

Print your name and address:

Account No.
PAGE
493072-4

Hartford

NOTIFY US OF ANY CHANGE OF ADDRESS

CHECKS	CODE	CHECKS	CODE	DEPOSITS	CODE	DATE	BALANCE
5 00		10 00				4-29-66	
16 78						5-01-66	
122 00		67 09				5-05-66	
98 43						5-07-66	
29 77		5 00		135 00		5-10-66	
60 00						5-15-66	
25 15						5-21-66	
6 87				52 79		5-22-66	
7 39						5-28-66	
1 64	4					5-29-66	

CODES:
1 - DEBIT MEMO
2 - ERROR CORRECTED
3 - LIST OF CHECKS
4 - SERVICE CHARGE
5 - REVERSE ENTRY
OD - OVERDRAFT

a.) Determine the balance for this statement.

CHECKS	CODE	CHECKS	CODE	DEPOSITS	BALANCE
					140 39
32 47		21 41			
12 11		95	1		
23 08		37 28		175 46	
102 41		5 63			
24 32		3 02			
19 17				83 82	
62 50		9 40			
2 00	2				

CODES 1 - Service Charge 2 - Overdrawn

Balance at Beginning ☐ + Deposits ☐ − Checks ☐ − Service Charges ☐ = Balance ☐

b.) Find balance for this bank statement.

CHECKS	CODE	CHECKS	CODE	DEPOSITS	BALANCE
					209 44
126 52		67 89			
29 07		13 41		96 40	
5 00		10 00			
82	1	1 40			
7 03		5 50		45 00	

CODE 1 - Service Charge

Balance at Beginning ☐ + Deposits ☐ − Checks ☐ − Service Charges ☐ = Balance ☐

11-3 Consumer Borrowing

Instead of buying on the installment plan, whereby your interest rate may be 12% or more, it would be cheaper to borrow money from a bank at a lower rate of interest and pay cash for your purchases.

When you borrow money from a bank you usually sign a promissory note promising to repay the amount of the loan (face of the note) at a given date (date of maturity). The interest that you pay for the use of the money borrowed is called bank discount, because the bank takes the interest in advance, and gives you the balance as the loan. The amount the borrower receives is the proceeds.

To find the bank discount, we use the formula for finding interest.

$i = prt$ "i" represents interest
"p" represents principal
"r" represents rate of interest
"t" represents time in years

The time may be given in days, months or years, but it must be used as years or a fraction of a year in the formula. Since there are 12 months in a year, the number of months given divided by 12 shows the part of a year. In banking, 360 days is considered an interest year: so the number of days in the problem divided by 360 shows the time as a fraction of a year.

Example 1:

1 mo. = 1/12 year	60 days = 60/360 or 1/6 year
8 mo. = 8/12 or 2/3 year	75 days = 75/360 or 5/24 year

11-3 EXERCISES A: Change the given time to part of a year:

1. 2 mo. = ______ year

2. 72 days= ______ year

3. 90 days= ______ year

4. 3 mo. = ______ year

5. 36 days= ______ year

6. 45 days= ______ year

7. 240 days= ______ year

8. 5 mo. = ______ year

9. 100 days= ______ year

10. 66 days= ______ year

11. 20 days = ______ year

12. 150 days = ______ year

13. 7 mo. = ______ year

14. 120 days = ______ year

15. 75 days = ______ year

16. 270 days = ______ year

17. 9 mo. = ______ year

18. 180 days = ______ year

19. 300 days = ______ year

20. 88 days = ______ year

To find the date of maturity we must use the exact number of days in each month.

January 31
February 28 (leap year 29)
March 31
April 30
May 31
June 30
July 31
August 31
September 30
October 31
November 30
December 31

Example: If the date of maturity is 90 days after June 16, we find the number of days left in June during which the money is used; that is, 30 - 16 or 14 days; in July there are 31 days, in August 31. So far we have 76 days. We need 90 - 76 or 14 more days to have 90. So the date of maturity is September 14.

11-3 EXERCISES B: Find the date of maturity for the following:

1. 60 days after March 12 ________

2. 45 days after May 27 ________

3. 90 days after July 5 ________

4. 36 days after Sept. 10 ____

5. 72 days after Nov. 18 _____

6. 66 days after Feb. 2 ____

11-3C Finding Bank Discount and Proceeds

Example: Find the bank discount and proceeds on a loan for $300. at 6% for 60 days. Find the date of maturity if the money was borrowed on January 3.

Solution:

a) i = prt

$$\text{interest} = \$300 \times \frac{6}{100} \times \frac{60}{360} \text{ or } \$3.00$$

b) Face of note - bank discount = proceeds
$300.00 - $3.00 = $297

date of maturity: January 28 days (31 - 3)
February 28 days
March 4 days
60 days

11-3 EXERCISES C: Complete the following chart. Find the interest to the nearest cent.

	FACE OF NOTE	RATE OF BANK DISCOUNT	TIME	BANK DISCOUNT	PROCEEDS	DATE OF NOTE	DATE OF MATURITY
1.	$960	4%	80 days	________	________	July 10	________
2.	$720	6%	75 days	________	________	Sept. 29	________
3.	$425	3½%	72 days	________	________	Jan. 21	________
4.	$ 84	5%	30 days	________	________	Aug. 1	________
5.	$870	6%	36 days	________	________	Mar. 17	________
6.	$1600	4½%	88 days	________	________	Oct. 2	________
7.	$420	3½%	36 days	________	________	Dec. 12	________
8.	$287	5½%	120 days	________	________	April 1	________
9.	$3648	4½%	300 days	________	________	June 23	________
10.	$480	2½%	42 days	________	________	Oct. 24	________

11. Mr. Block borrowed $180 for 60 days at 4%. How much was the bank discount? How much is paid to Mr. Block by the bank? How much does Mr. Block pay to the bank after 60 days?

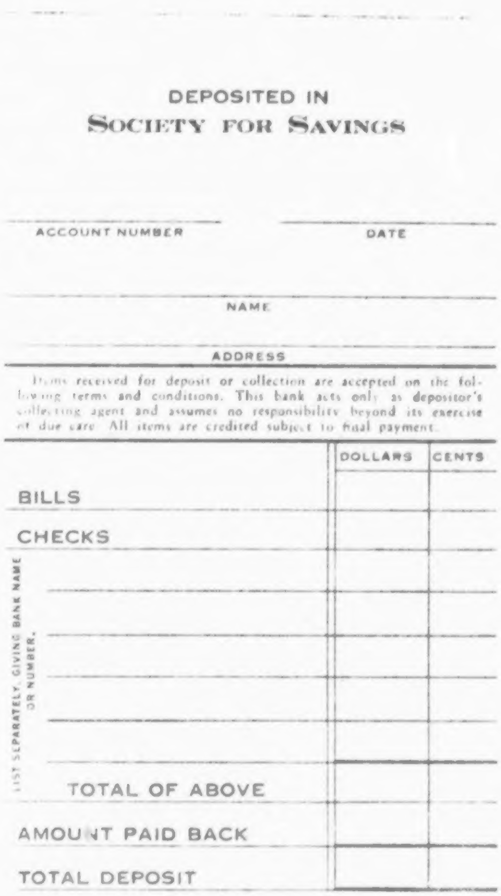
12. Mr. King borrowed $5,000 at 5% for 3 months from CBT. Find the bank discount. Find the net proceeds. Find the amount due in 3 months.

11-3D Savings Account

If you deposit money in a savings account, the bank pays you interest on your money. (When you deposit money in a checking account, you get no interest on your money.) The bank pays you interest because, in a sense, the bank is renting your money. The bank uses your money to make their own investments in stocks and bonds. Therefore, the bank pays you interest on your money for the privilege of using it for their own purposes.

This is a deposit slip showing how much money you are going to deposit in your account. Your account number is 4709-372. Put in today's date. Print your full name and your address. You are depositing $50.75 in cash (bills). You are also depositing a check for $105.39. The number of the check is $\frac{51-57}{111}$.

Make out the deposit slip and show what the total deposit will be.



DEPOSITED IN
SOCIETY FOR SAVINGS

ACCOUNT NUMBER DATE

NAME

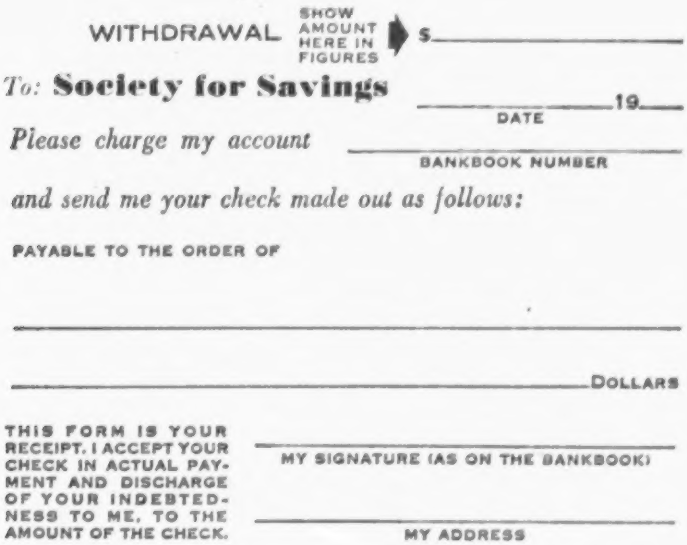
ADDRESS

Items received for deposit or collection are accepted on the following terms and conditions. This bank acts only as depositor's collecting agent and assumes no responsibility beyond its exercise of due care. All items are credited subject to final payment.

	DOLLARS	CENTS
BILLS		
CHECKS		
LIST SEPARATELY, GIVING BANK NAME OR NUMBER.		
TOTAL OF ABOVE		
AMOUNT PAID BACK		
TOTAL DEPOSIT		

11-3E Savings Account

This is a withdrawal slip showing how much money you are going to take out of your account. Use the same account number that you used on the preceding page. Make the withdrawal payable to CASH, since you are drawing out the money. Complete the withdrawal slip. Use today's date, and enter $75.47 as the amount to be withdrawn.



WITHDRAWAL SHOW AMOUNT HERE IN FIGURES ➧ $________________

To: **Society for Savings** ________________19___
DATE

Please charge my account ____________________
BANKBOOK NUMBER

and send me your check made out as follows:

PAYABLE TO THE ORDER OF

____

______________________________________DOLLARS

THIS FORM IS YOUR RECEIPT. I ACCEPT YOUR CHECK IN ACTUAL PAYMENT AND DISCHARGE OF YOUR INDEBTEDNESS TO ME, TO THE AMOUNT OF THE CHECK.

____
MY SIGNATURE (AS ON THE BANKBOOK)

____
MY ADDRESS

11-3 EXERCISES F

You are making a deposit of three checks on September 7, 19__. They are for $17.76, $95.03, $52.50. You want $25.00 Cash Paid Back. Make out the deposit slip.

On September 15, 19__, you withdrew $35.00. Make out the withdrawal slip.

SAVINGS DEPOSIT SLIP
DEPOSITED IN
THE CONNECTICUT BANK
AND TRUST COMPANY

________________ OFFICE

DATE __________ 19 ___ ACC'T NO. __________

NAME ______________________________

ADDRESS ______________________________

BILLS		
COIN		
CHECK		
"		
"		
"		
"		
"		
"		
"		
TOTAL		
CASH PAID BACK		
TOTAL DEPOSIT		

FORM NO. 13

SAVINGS WITHDRAWAL
THE CONNECTICUT BANK
AND TRUST COMPANY

________________ OFFICE

DATE __________ 19 ___ ACCOUNT NO. __________

PAY TO MYSELF OR BEARER: $ __________

______________________________ DOLLARS

SIGNATURE ______________________________

____

ADDRESS ______________________________

____

PASSBOOK MUST BE PRESENTED WITH THIS ORDER

✕✕✕✕✕ PLEASE DO NOT WRITE BELOW THIS LINE ✕✕✕✕✕

11-3G Finding Interest and Amount

To find the interest, you multiply the principal (the amount of money in your savings account) times the rate, times the time (in years). This is expressed in the formula: i = prt which means i = p x r x t. As the money earns interest in your savings account, the interest is periodically added to the principal. The sum of the principal and the interest is the amount. A = p + i

Example: Frank had $860 in the bank at 4½% for 3 years. Find the interest. Find the amount.

Solution:

a) i = p x r x t

i = $860 x .045 x 3 = $116.10

b) A = p + i

A = $860 + $116.10 = $976.10

11-3 EXERCISES G

	PRINCIPAL	RATE	TIME	INTEREST	AMOUNT
1.	$1000	3½%	180 days	________	______
2.	$ 800	4½%	15 mo.	________	______
3.	$1500	5%	45 days	________	______
4.	$1200	4¼%	18 mo.	________	______
5.	$ 150	6%	33 mo.	________	______
6.	$ 360	4%	40 mo.	________	______
7.	$ 275	5%	120 days	________	______
8.	$1800	5½%	56 mo.	________	______
9.	$ 420	6%	270 days	________	______
10.	$ 75	7%	3 mo.	________	______

11-3H Finding Interest Using the 6% - 60 Day Method

To find the interest on $180 at 6% for 60 days use the formula i = prt

$$i = 180 \times \frac{6}{100} \times \frac{60}{360} = \$1.80$$

Notice that you can find the interest for 60 days at 6% by moving the decimal point two places to the left in the principal. Since 60 days = 1/6 year and 1/6 of 6% = 1%, the interest is 1% or 1/100 of the principal for 60 days. When you multiply a number by .01, you move the decimal point two places to the left in the number.

11-3 EXERCISES H: Find the interest for 60 days at 6% on the following principals.

1. $300. ________
2. $450. ________
3. $510. ________
4. $625. ________
5. $175. ________
6. $ 85. ________
7. $293. ________
8. $748. ________
9. $ 10.50 ________
10. $ 15.00 ________

11-3I

Example 1: Find the interest on $180 at 6% for 30 days.

Since 30 days is ½ of 60 days, the interest for 30 days is ½ as much as the interest for 60 days. The interest on $180 at 6% for 60 days is $180, therefore, the interest for 30 days is ½ of $1.80 or $.90

Example 2: Find the interest on $180 at 6% for 90 days.

Since 90 days is 9/6 or 3/2 of 60 days, the interest for 90 days is 3/2 as much as the interest for 60 days, or 3/2 x $1.80 or $2.70

11-3 EXERCISES:I

Find the interest at 6% for the following:

	Interest at 6% for 60 days	Interest at 6% for time
1. $800 for 30 days		
2. $350 for 90 days		
3. $210 for 40 days		
4. $720 for 50 days		

Find the interest at 6% for the following. Round off the interest to the nearest cent.

	Interest at 6% for 60 days	Interest at 6% for time
5. $132 for 45 days		
6. $560 for 75 days		
7. $ 78 for 80 days		
8. $840 for 120 days		
9. $910 for 100 days		
10. $525 for 180 days		

11-3J

Example 3: Find the interest on $180 at 5% for 60 days.

Since 5% is 5/6 of 6%, the interest at 5% is 5/6 of the interest for 6%, or 5/6 x $1.80 or $1.50

11-3 EXERCISES J: Find the interest for 60 days on each loan. Round off the interest to the nearest cent.

	Interest at 6% for 60 days	Interest for 60 days at given rate
1. $ 750 at 5%		
2. $ 690 at 3%		
3. $ 150 at 4%		
4. $ 24 at 2%		
5. $1200 at 8%		
6. $ 960 at 9%		

	Interest at 6% for 60 days	Interest for 60 days at given rate
7. $3000 at 4%	________	________
8. $ 845 at 5%	________	________
9. $ 75 at 7%	________	________
10. $ 210 at 3%	________	________

11-3K

Example 4: Find the interest on $180 at 4½% for 72 days using the 6%-60 day method.

Solution:

4½% = 3/4 of 6%

72 days = 72/60 or 6/5 of 60 days

Interest on $180 at 6% for 60 days = $1.80

Interest on $180 at 4½% for 72 days =

$1.80 x 3/4 x 6/5 = $1.62

11-3 EXERCISES K

	Principal	Rate	Time	Interest at 6% for 60 Days	Interest for Given Rate & Time
1.	$1000	3%	40 days	________	________
2.	$ 600	4%	20 days	________	________
3.	$ 210	5%	30 days	________	________
4.	$ 18	4½%	80 days	________	________
5.	$ 120	3%	10 days	________	________
6.	$ 800	4%	75 days	________	________
7.	$ 750	5%	90 days	________	________
8.	$1500	4½%	180 days	________	________
9.	$ 475	1½%	270 days	________	________
10.	$ 180	3½%	45 days	________	________

11-3L Compound Interest

Savings bank may pay interest on savings annually (every 12 months), semi-annually (every 6 months), or quarterly (every three months). If you leave the interest in your account, it will be added to your principal as a deposit. At the end of an interest period, you will receive interest on the interest as well as on the principal. This is called compound interest.

Example: If you deposit $1000 in the Society for Savings, and the interest is compounded annually, find the amount in the bank at the end of three years.

Solution:

a) Find the interest for 1 year.

i = prt   i = $1000 x .04 x 1   or $40 for 1 year

b) Add the interest to the principal.

A = p + i   A = $1000 + $40 = $1040 this amount becomes the principal for the next year.

c) Find the interest for 1 year on the principal for the second year.

i = prt   i = $1040 x .04 x 1 or $41.60, interest for second year.

d) Add the interest for the second year to the principal for the second year.

A = p + i   A = $1040 + $41.60 or $1081.60 amount for second year is principal for third year.

e) Find the interest for 1 year on the principal for the third year.   i = prt

i = $1081.60 x .04 x 1 or $43.26, interest for third year.

f) Add the interest for the third year to the principal for the third year.

A = p + i   A = \$1081.60 + \$43.26 or \$1124.86, Amount in account after three years.

\$1124.86 - \$1000.00 = \$124.86 interest earned

If you had found the simple interest (no interest on interest), you would have received \$1000 x .04 x 3 = \$120. for three years instead of \$124.86.

Example 2: Find the interest on \$1000 at 4% for 3 years compounded semi-annually. Find the amount after 3 years. Find the interest after 3 years.

Solution: When interest is compounded semi-annually (every 6 months), you use half the given rate, and add the interest to the principal at the close of each 6 months making two interest periods each year. The semi-annual interest in this problem is 2% and interest is added to successive principals 6 times during 3 years.

The interest on \$1000 at 2% for the first 6 months is \$20. At the end of the first six months, you would have \$1000 + \$20 or \$1020 in your account. The interest on \$1020 for the next 6 month period would be \$1020 x .02 or \$20.40. At the end of the first year you would have \$1020 + \$20.40 or \$1040.40. To simplify your work, you can put this information in table form like this:

First six months: \$1000 x .02 = \$20.00 + \$1000 = \$1020.00

Second six months: \$1020 x .02 = \$20.40 + \$1020 = \$1040.40

Third six months: \$1040.00 x .02 = \$20.80 + \$1040.40 = \$1061.20

(Most banks disregard cents in compound interest. Such banks would compute interest on \$1040 instead of \$1040.40)

Fourth six months: $1061.00 x .02 = $21.22 + $1061.20 =
$1082.44

Fifth six months: $1082 x .02 = $21.64 + $1082.44 =
$1104.08

Sixth six months: $1104 x .02 = $22.08 + $1104.08 =
$1126.16 amount after 3 years
$1126.16 - $1000.00 = $126.16
interest earned

Example 3: Find the interest on $1000at 4% for 3 years, compounded quarterly.

Solution: When interest is compounded quarterly (every 3 months) you use one-fourth of the rate, because 3 months is 1/4 of a year. Then add the interest to the principal at the close of every three months making four periods each year. The Society for Savings, Mechanics Savings Bank, Dime Savings Bank and Federal Savings Bank give interest compounded quarterly.

The quarterly interest rate in this problem is 1%. Interest is added to successive principals 12 times during 3 years.

First quarter: $1000 x .01 = $10.00 + $1000.00 = $1010.00
Second quarter: $1010 x .01 = $10.10 + $1010.00 = $1020.10
Third quarter: $1020 x .01 = $10.20 + $1020.10 = $1030.30
Fourth quarter: $1030 x .01 = $10.30 + $1030.30 = $1040.60
Fifth quarter: $1040 x .01 = $10.40 + $1040.60 = $1051.00
Sixth quarter: $1051 x .01 = $10.51 + $1051.00 = $1061.51
Seventh quarter: $1061 x .01 = $10.61 + $1061.51 = $1072.12
Eighth quarter: $1072 x .01 = $10.72 + $1072.12 = $1082.84
Ninth quarter: $1082 x .01 = $10.82 + $1082.84 = $1093.66
Tenth quarter: $1093 x .01 = $10.93 + $1093.66 = $1104.59
Eleventh quarter: $1104 x .01 = $11.04 + $1104.59 = $115.63
Twelfth quarter: $1115 x .01 = $11.15 + $115.63 = $1126.78

\$1126.78 - \$1000 = \$126.78, interest earned

Let us compare the amounts and the interest:

	Simple interest	Compounded annually	Compounded semi-annually	Compounded quarterly
Amount	\$1120.00	\$1124.86	\$1126.16	\$1126.78
Interest	\$ 120.00	\$ 124.86	\$ 126.16	\$ 126.78

11-3 EXERCISES M

1. If you have \$1200 in your savings account, how much will you have in your account after two years (8 quarters) if the interest rate is 4% and the interest is compounded quarterly?

2. What amount would you have in your savings account after two years, if you now have **\$1200** and the interest is compounded semi-annually at an interest rate of 4% per year?

3. Find the amount of \$5000 at 6% per year for 3 years if the interest is compounded annually. How much interest would you receive?

4. What is the amount of \$5000 at 6% per year for 3 years if the interest is compounded semi-annually? Find the compound interest at 3% for 6 periods.

5. Find the amount of \$2000 at 6% per year, if the rate of interest is compounded quarterly for 1 year. (Use 1½% for 4 periods.)

6. a) Find the interest on $800 at 4% for 2 years simple interest.

   b) Find the interest on $800 at 4% for 2 years compounded annually.

   c) Find the interest on $800 at 4% for 2 years compounded semi-annually. (at 2% for 4 periods)

   d) Find the interest on $800 at 4% for 2 years compounded quarterly. (at 1% for 8 periods)

   e) Compare the amounts and the interest in part (a), (b), (c), and (d).

	Simple Interest	Compounded Annually	Compounded Semi-Annually	Compounded Quarterly
Amount				
Interest				

11-3N Compound Interest - Using Tables

Finding compound interest by the method you have used in section 11-3M takes a long time, even when you use the machine. Most banks use tables such as this one to determine compound interest.

Annual Compound Interest Table (*Principal*, $1)

YEAR	1%	1½%	2%	2½%	3%	4%	5%	6%
1	1.0100	1.0150	1.0200	1.0250	1.0300	1.0400	1.0500	1.0600
2	1.0201	1.0302	1.0404	1.0506	1.0609	1.0816	1.1025	1.1236
3	1.0303	1.0457	1.0612	1.0769	1.0927	1.1249	1.1576	1.1910
4	1.0406	1.0614	1.0824	1.1038	1.1255	1.1699	1.2155	1.2625
5	1.0510	1.0773	1.1041	1.1314	1.1593	1.2167	1.2763	1.3382
6	1.0615	1.0934	1.1262	1.1597	1.1941	1.2653	1.3401	1.4185
7	1.0721	1.1098	1.1487	1.1887	1.2299	1.3159	1.4071	1.5036
8	1.0829	1.1265	1.1717	1.2184	1.2668	1.3686	1.4775	1.5938
9	1.0937	1.1434	1.1951	1.2489	1.3048	1.4233	1.5513	1.6895
10	1.1046	1.1605	1.2190	1.2801	1.3439	1.4802	1.6289	1.7908
11	1.1157	1.1779	1.2434	1.3121	1.3842	1.5395	1.7103	1.8983
12	1.1268	1.1956	1.2682	1.3449	1.4258	1.6010	1.7959	2.0122

Example 1: Find amount on $875 at 5% for 6 years compounded annually.

Solution:

Under the 5% column across the row for the 6th year you will find the number 1.3401. This is the amount $1.00 becomes compounded annually at 5% for 6 years. Multiply this factor by the principal to get the amount. $875 x 1.3401 = $1172.5875, when rounded off to the nearest cent is $1172.59.

To find the interest, subtract the principal from the amount. $1172.59 - $875.00 = $297.59, compound interest at 5% for 6 years on $875.

Example 2: Find the amount on $759 at 4% for 5 years compounded semi-annually.

The interest is computed twice a year at half the rate. In five years there will be 10 periods of interest (two times the number of years) at 2%.

In the 2% column across the 10 year row, find 1.2190, which is the amount of $1. at 2% for 10 years. Multiply $759 x 1.2190 to find the amount $924.00 Subtract the principal from the amount to find the interest.

$924.00 - $759.00 = $165.00, interest at 2% for 10 years, compounded annually or interest at 4% for 5 years compounded semi-annually.

Example 3: Find the amount on $1750 at 6% for 3 years compounded quarterly.

Since the interest compounded quarterly is computed four times a year, you use ¼ of 6% or 1½% rate and four times the number of years or 12 years. Under the 1½% column across the 12 year row, the amount for investing $1.00 is 1.1956. Multiply $1750 x 1.1956 to find the amount $2092.30 Subtract the principal from the amount to find the interest. $2092.30 - $1750.00 = $342.30, interest on $1750 at 6% for 3 years compounded quarterly.

11-3 EXERCISES O: Use the table above to find the amount and the interest.

Principal	Rate	Time	Period	Amount	Interest
1. $ 500	3%	4 years	annually	______	______
2. $ 420	4%	5 years	annually	______	______
3. $1840	6%	8 years	annually	______	______
4. $ 650	6%	5 years	semi-annually	______	______
5. $ 432	5%	3 years	semi-annually	______	______
6. $1275	4%	5 years	semi-annually	______	______
7. $ 740	8%	3 years	quarterly	______	______
8. $ 125	4%	12 years	quarterly	______	______
9. $ 805	10%	3 years	quarterly	______	______
10. $ 50	2½%	1 year	annually	______	______

11-4 United States Savings Bonds

11-4A Series E Savings Bonds

Investing your money in United States Savings Bonds is another way in which your savings can earn money for you. If you buy government bonds, you are lending money to U.S.A. A bond represents our government's promise to pay back a loan at a specified rate of interest, approximately 4.15% per year compounded semi-annually. You can purchase Series E Savings bonds in denominations of $25., $50., $75., $100., $200., $500., $1000., and $10,000. These prices represent the face value, the amount you receive if you keep them to maturity, seven years from the date of purchase. The corresponding purchase price of each Series bond is 3/4 of its matured value. If you redeem a bond before its date of maturity, its value is less than its matured value. Here is a table of redemption values of a $100 Series E Bond.

REDEMPTION VALUES

$100 E Bonds* Issued December 1, 1965 and After
From Issue Date to Maturity

Period Held	Redemption Value	Period Held	Redemption Value
First ½ year.	$75.00	3½ to 4 years	$85.68
½ to 1 year..	75.84	4 to 4½ years	87.56
1 to 1½ years	77.28	4½ to 5 years	89.48
1½ to 2 years	78.80	5 to 5½ years	91.44
2 to 2½ years	80.40	5½ to 6 years	93.44
2½ to 3 years	82.08	6 to 6½ years	95.52
3 to 3½ years	83.84	6½ to 7 years	97.68
MATURITY VALUE (7 years)......$100.00			

* For $25 bond multiply by ¼; $50 by ½; $75 by ¾; etc

11-4B Series H Savings Bonds

Series H Savings Bonds are issued by Federal Reserve Banks and branches in denominations of $500., $1000., $5000., and $10,000. and mature after 10 years. The owner receives interest checks every six months at the rate of approximately 4.15% per year compounded semi-annually.

SEMIANNUAL INTEREST CHECKS ON H BONDS

Bonds Bearing Issue Date December 1, 1965 and After	Denominations			
	$500	$1,000	$5,000	$10,000
First check (after 6 months)	$ 5.50	$11.00	$ 55.00	$110.00
Next check (1 year)	9.70	19.40	97.00	194.00
Next 18 checks	10.75	21.50	107.50	215.00

11-4C Freedom Shares

Freedom Shares are United States Savings notes. Only individuals who purchase Series E Savings Bonds under a Payroll Savings Plan or a Bond-a-month plan are eligible to purchase savings notes. The notes must be purchased simultaneously with Series E Bonds. Payroll savers must purchase the Bond-note combination through the employing company which operates the Payroll Savings Plan; Bond-a-Month participants must purchase the Bond-note combination through the financial institution which operates the Plan for the benefit of its customers. Notes may not be purchased in any other manner: unlike Savings Bonds they cannot be bought over-the-counter for cash. An individual may buy more Series E Bonds than notes, but he may not buy more notes than Series E Bonds.

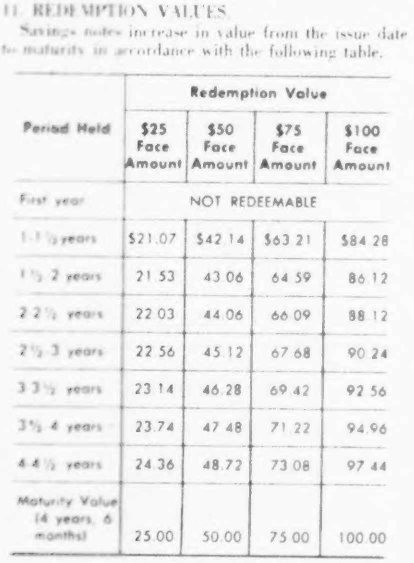
United States Savings notes are issued in four denominations: $25., $50., $75., and $100 notes. The corresponding issue costs are as follows:

Denomination	$25	$50	$75	$100
Issue Price	$20.25	$40.50	$60.75	$81.00

Interest is added to savings notes through increases in the redemption value as in Series E Bonds. Increases are effective after one year from the date of issue and at the beginning of each half year period until maturity 4 years 6 months after the date of issue.

Interest is compounded semi-annually at approximately 4.74% per year. If United States Savings notes are redeemed before maturity, the yield is less (4.01% after 1 year; 4.26% after 2 years, 4.50% after 3 years, 4.67% after 4 years and 4.74% after 4½ years)

The following chart shows the redemption values of Freedom Shares.



11. REDEMPTION VALUES.

Savings notes increase in value from the issue date to maturity in accordance with the following table.

Period Held	Redemption Value			
	$25 Face Amount	$50 Face Amount	$75 Face Amount	$100 Face Amount
First year	NOT REDEEMABLE			
1-1½ years	$21.07	$42.14	$63.21	$84.28
1½-2 years	21.53	43.06	64.59	86.12
2-2½ years	22.03	44.06	66.09	88.12
2½-3 years	22.56	45.12	67.68	90.24
3-3½ years	23.14	46.28	69.42	92.56
3½-4 years	23.74	47.48	71.22	94.96
4-4½ years	24.36	48.72	73.08	97.44
Maturity Value (4 years, 6 months)	25.00	50.00	75.00	100.00

11-4 EXERCISES D

1. The purchase price of a Series E Savings Bond is 3/4 of its matured value. Find the purchase price of each of the following Series E Savings Bonds.

	Face Value	Purchase Price
a)	$25	________
b)	$50	________
c)	$75	________
d)	$100	________
e)	$200	________
f)	$500	________
g)	$1000	________
h)	$10,000	________

2. If a bond purchased at $75 increases in value to $100 in 7 years, what was the per cent of increase in seven years? What was the average increase per year? (Find to the nearest hundredth of a per cent.)

3. If you bought a $25 bond each month for 10 years, (a) how many bonds would you have? (b) How much would these bonds have cost you? (c) What is the matured value of these bonds?

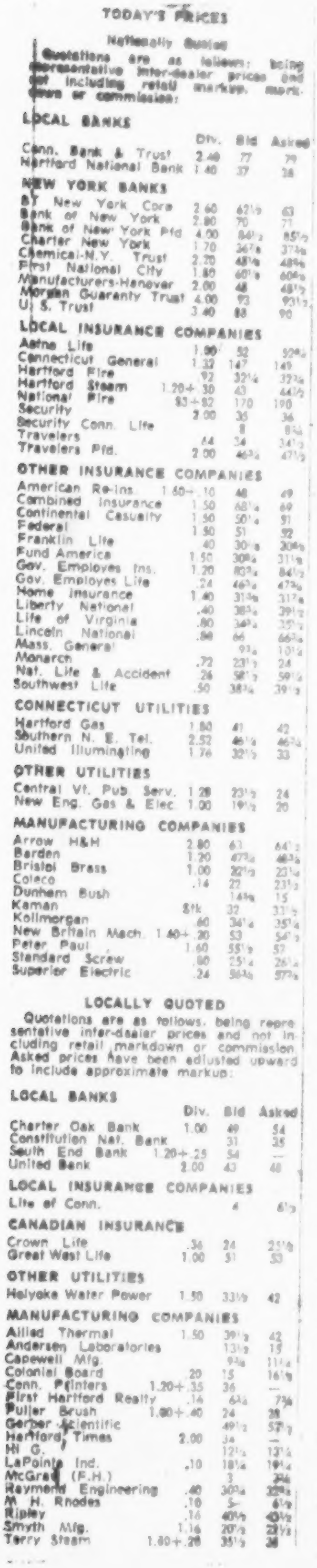
4. If you wanted to redeem twenty $25 U.S. Savings Bonds after 5 years, how much cash would you receive? (Use table) How much would these bonds be worth, if you kept them 7 years?
How much more would you receive, if you kept them until maturity?

5. How many weeks would it take you to save enough to buy a $25 Series E bond if you saved $1.25 per week?

6. If you were enrolled in the Payroll Savings Plan where you work, and you had $1.00 a week withheld to purchase Freedom Shares, how many weeks would it take to purchase one $25 United States Savings note?

7. If you purchased one $25 Series E bond and one $25 Freedom Share per month, on the payroll savings plan, how much would you have taken from your pay checks during one year?

11-5 Stocks



TODAY'S PRICES

Nationally Quoted

Quotations are as follows: being representative inter-dealer prices and not including retail markup, markdown or commission:

	Div.	Bid	Asked
LOCAL BANKS			
Conn. Bank & Trust	2.40	77	79
Hartford National Bank	1.40	37	38
NEW YORK BANKS			
BT New York Corp	2.60	62½	63
Bank of New York	2.80	70	71
Bank of New York Pfd	4.00	84½	85½
Charter New York	1.70	36⅞	37⅜
Chemical-N.Y. Trust	2.20	48⅛	48⅝
First National City	1.80	60⅛	60⅝
Manufacturers-Hanover	2.00	48	48½
Morgan Guaranty Trust	4.00	93	93½
U. S. Trust	3.40	88	90
LOCAL INSURANCE COMPANIES			
Aetna Life	1.80	52	52⅝
Connecticut General	1.32	147	149
Hartford Fire	.92	32¼	32¾
Hartford Steam	1.20+.30	43	44½
National Fire	$3+$2	170	190
Security	2.00	35	36
Security Conn. Life		8	8¾
Travelers	.64	34	34½
Travelers Pfd.	2.00	46¾	47½
OTHER INSURANCE COMPANIES			
American Re-Ins.	1.60+.10	48	49
Combined Insurance	1.50	68¼	69
Continental Casualty	1.50	50¼	51
Federal	1.50	51	52
Franklin Life	.40	30⅛	30⅝
Fund America	1.50	30⅝	31⅛
Gov. Employes Ins.	1.20	83¾	84½
Gov. Employes Life	.24	46¾	47¾
Home Insurance	1.40	31⅜	31⅞
Liberty National	.40	38¾	39½
Life of Virginia	.80	34¾	35½
Lincoln National	.88	66	66¾
Mass. General		9¾	10¼
Monarch	.72	23½	24
Nat. Life & Accident	.26	58½	59½
Southwest Life	.50	38¾	39½
CONNECTICUT UTILITIES			
Hartford Gas	1.80	41	42
Southern N. E. Tel.	2.52	46¼	46¾
United Illuminating	1.76	32½	33
OTHER UTILITIES			
Central Vt. Pub. Serv.	1.28	23½	24
New Eng. Gas & Elec.	1.00	19½	20
MANUFACTURING COMPANIES			
Arrow H&H	2.80	63	64½
Barden	1.20	47¾	48¾
Bristol Brass	1.00	22½	23¼
Coleco	.14	22	23½
Dunham Bush		14⅝	15
Kaman	Stk	32	33½
Kollmorgen	.60	34¼	35¼
New Britain Mach.	1.40+.20	53	54½
Peter Paul	1.60	55½	57
Standard Screw	.80	25¼	26¼
Superior Electric	.24	56¾	57¾

LOCALLY QUOTED

Quotations are as follows, being representative inter-dealer prices and not including retail markdown or commission. Asked prices have been adjusted upward to include approximate markup:

	Div.	Bid	Asked
LOCAL BANKS			
Charter Oak Bank	1.00	49	54
Constitution Nat. Bank		31	35
South End Bank	1.20+.25	54	—
United Bank	2.00	43	48
LOCAL INSURANCE COMPANIES			
Life of Conn.		6	6½
CANADIAN INSURANCE			
Crown Life	.36	24	25⅛
Great West Life	1.00	51	53
OTHER UTILITIES			
Holyoke Water Power	1.50	33½	42
MANUFACTURING COMPANIES			
Allied Thermal	1.50	39½	42
Andersen Laboratories		13½	15
Capewell Mfg.		9¾	11¼
Colonial Board	.20	15	16½
Conn. Printers	1.20+.35	36	—
First Hartford Realty	.16	6¾	7¾
Fuller Brush	1.80+.40	24	28
Gerber Scientific		49½	57½
Hartford Times	2.00	34	—
Hi G.		12½	13¼
LaPointe Ind.	.10	18¼	19¼
McGraw (F.H.)		3	3¾
Raymond Engineering	.40	30¾	32¾
M. H. Rhodes	.10	5	6½
Ripley	.16	40½	40½
Smyth Mfg.	1.16	20½	22½
Terry Steam	1.80+.20	35½	38

Sometimes a person is able to save enough money in a savings account to provide a down payment for a home, to have extra money for Christmas or a vacation, and to take care of hospital bills or other unexpected emergencies. If he is able to save a little more money, he may want to buy some stock in a corporation, such as the Hartford Gas Company, the Southern New England Telephone Company, the Aetna Life Insurance Company, or the United Aircraft Corporation. These companies often encourage their employees to set aside some money from each pay check to purchase shares of stock in the company.

In the financial pages in the Hartford Times or the Courant, the price of available stocks is listed every day. The price asked (market value) is the amount you pay for a share of stock when you buy it; the price bid is the amount you get when you sell a share of stock. When the price of a share of a stock is listed with a fraction, that fraction indicates the part of a dollar. ½ means \$.50, ¼ means \$.25, 3/4 means \$.75, 1/8 means \$.12½, 3/8 means \$.37½, 5/8 means \$.62½, 7/8 means \$.87½. The dividend is the amount you receive per year on each share of stock you own. Dividends are usually paid quarterly. As a stockholder, you share in the profits of the organization.

Example: How much will 12 shares of Constitutional National Bank stock cost at 34¼?

Solution: 12 x $34.25 = $411.00

11-5 EXERCISES A: Find the cost of each of the following orders.

1. 10 shares of Conn. Bank and Trust Co. stock at 7[illegible] ______
2. 25 shares of Hartford National Bank stock at 38 ______
3. 50 shares of Bank of New York Pfd at 85½ ______
4. 15 shares of First National City Bank at 60 5/8 ______
5. 12 shares of Aetna Life Insurance stock at 52 3/4 ______
6. 30 shares of Southern New England Telephone at 46 7/8 ______
7. 8 shares of Arrow Hart and Hegeman at 64½ ______
8. 50 shares of Kaman at 33½ ______
9. 18 shares of Standard Screw at 26¼ ______
10. 100 shares of Capewell Manufacturing Co. at 11¼ ______

11-5B Brokerages Charges

You usually buy stock from a broker, who charges a commission (brokerage fee) according to the amount of money being invested and the number of shares of stock involved.

The New York Stock Exchange charges the following rates of commission.

$100 to $399.99 ..... 2% + $3.00 (minimum $6.00)
$400 to $2399.99 .... 1% + $7.00
$2400 to $4999.99 ... ½% + $19.00
over $5000 .... 1/10% + $39.00

Example: Find the commission on 10 shares of Standard Screw stock at 26¼.

Solution:

10 x $26.25 = $262.50; The commission is 2% + $3.00.

Therefore, 2% of $262.50 = $5.25; $5.25 + $3.00 = $8.25

11-5 EXERCISES B: Find the commission on the following:

	Price	Commission
1. 5 shares of Hartford Fire Ins. Co. @ 32 3/4	______	__________
2. 15 shares of Conn. Bank & Trust Co. @ 79	______	__________
3. 100 shares of Travelers Ins. Co. @ 34½	______	__________
4. 20 shares of SNET @ 46 3/4	______	__________
5. 12 shares of Peter Paul Candies @ 54½	______	__________

11-5 EXERCISES C

1. If J. Donovan owns 35 shares of Hartford National Bank & Trust Company stock, find how much he receives per year at $1.40 per share. How much will he receive each quarter (every 3 months)?

2. Kaman Aircraft Corporation issues a 3% stock dividend. If you had 340 shares of stock, how many shares would you receive as a dividend? If the market value of one share of stock is 33½, how much cash would you receive for the fractional part of a share issued as dividend?

3. The annual dividend issued on Northeast Utilities stock is $1.10 per share. If the asked price is $17.00, what is the per cent of dividend? Find to nearest hundredth per cent.

4. A dividend of 5½% is declared for the year. How much dividend will be paid on 100 shares of stock listed at 42 3/4?

5. How many shares of Caldor stock at 16 1/8 can be purchased for $1200.? (Round off to number of whole shares.)

6. If the capital stock of a corporation increased from $750,000 to one million dollars, what was the per cent of increase?

7. A corporation with capital stock of $175,000 issues 25,000 shares of stock. What is the par value of each share of stock?

8. How many shares of Gerber Scientific stock at 42 3/4 can be purchased for $2864.25?

11-6 Life Insurance

You have been studying about saving money in a savings account at a bank, by purchasing United States Savings Bonds, or by investing in stocks.

Some people buy a life insurance policy as a form of savings. If you were able to buy a $10,00 life insurance policy at 16 years of age, the annual premium would be about $79.00 for a straight life policy. When you buy a straight life policy, you pay the same annual premium as long as you live. Suppose you live to be a hundred years old.

You would pay (100 - 16) 84 x $79 = $6636 in premiums. When you die at any age, while your policy is in force, your beneficiary would receive $10,000. How is it possible for the insurance company to pay your beneficiary more than you have invested?

The following pages describe several kinds of life insurance policies issued and annual premium costs.

Notice that the cost of the annual premium varies with the age of the person insured, the kind of insurance, the number of annual premiums and the face of the policy.

KINDS OF LIFE INSURANCE POLICIES

When a person buys life insurance, he receives a *policy* specifying a particular kind of life insurance. There are four basic kinds of life insurance: term insurance, straight life, limited-payment life, and endowment. By looking at how families use each, we can better understand how each works.

Mike Dudley is 35 and has three children. Mike just bought a new house for $22,000. He has an $18,000 mortgage on it, with the bank, which he will pay over a period of 20 years. But Mike doesn't want to risk leaving such a big debt to his wife if he should die before the mortgage is paid off. So Mike bought a *term insurance policy*. The policy he bought runs for 20 years, the same length of time as the mortgage, and declines in amount as payments made on the mortgage reduce the amount due. That is, if Mike should die, enough money to pay the mortgage would go to his wife and she would own the house free and clear. If he lives, as he probably will, the protection will stop after 20 years when his need for it is over.

Mike's brother, Joe, is a young married man 26 years old. He and his wife recently had a baby boy and so Joe took out a *straight life insurance policy* which provided "lifetime" protection in the amount of $5,000, as long as he pays his premium every year. If Joe should die, $5,000 will go to his wife, Ann, who is called the *beneficiary*. This money will help Ann and the baby until some other arrangement can be worked out.

The Dudleys' father is now retired. When he was a younger man, he bought a *limited-payment life policy*. This is like straight life insurance in that it provides lifetime protection. But, premiums are paid only during a specified period of time, say, for 20 years. Mr. Dudley wanted to pay his premiums during his working years. With this arrangement, Mr. Dudley's retirement years are much more carefree. Since fewer premiums are called for on a limited-payment policy than on the average straight life policy, each premium is larger.

Mike's neighbor, Tom White, is a new father and he already looks forward to the day his baby girl goes to college. In order to have the necessary funds on hand for college, Tom took out an 18-year *endowment policy* on his own life. This combines a savings plan with life insurance protection. If Tom should die before his daughter reaches age 18, the money will be available immediately. If he lives, the money will be available to help pay her college expenses or will be a start for some other career or marriage.

1. STRAIGHT LIFE INSURANCE *protects against the risk of death during the entire lifetime of the policyholder.*
2. TERM INSURANCE *gives protection for only a limited period or term of years.*
3. LIMITED-PAYMENT LIFE INSURANCE *offers lifetime protection, but is paid for in a specified number of years.*
4. ENDOWMENT INSURANCE *gives protection for a certain number of years, after which the insurance ceases and the owner receives the face amount of the policy.*

YEARLY PREMIUM COSTS

For $1,000 of Term Insurance

Age	5 Yrs.	10 Yrs.	15 Yrs.	20 Yrs.
20	3.66	3.77	3.88	4.01
25	3.74	4.00	4.26	4.52
30	4.02	4.50	5.08	5.66
35	4.63	5.63	6.63	7.63
40	6.15	7.70	9.30	10.90

For $1,000 of Straight Life Insurance

Age	Semi-Annual	Annual
20	7.07	14.13
25	8.13	16.25
30	9.46	18.92
35	11.17	22.34
40	13.39	26.77

For $1,000 of Limited-Payment Life Insurance

Age	10 Payment	20 Payment	Life Paid Up At 65
20	43.49	25.14	15.23
25	47.77	27.66	17.81
30	52.65	30.62	21.22
35	58.26	34.14	26.39
40	64.72	38.40	33.45

For $1,000 of Endowment Life Insurance

Age	Twenty Year	At Age 65	At 60
20	45.78	17.63	19.85
25	46.10	20.76	23.72
30	46.67	24.89	29.52
35	47.68	31.06	37.53
40	49.37	39.58	49.37

11-6 EXERCISES A: On the preceding page, you will find tables showing the yearly premium costs of different kinds of life insurance. The costs shown are for each $1,000 worth of insurance.

1. Suppose you were 20 years old and you decided to take out a 5 year Term insurance policy for $1,000. What would your yearly premium be? Answer $______

2. Suppose you wanted $2,000 worth of insurance instead of $1,000. What is your premium now? (How many thousands are there in $2,000?) Answer $______

3. Suppose you wanted a $10,000 policy. What is your premium? (How many thousands are there in $10,000?)
Answer $______

4. Find the premium for a $5,000 term insurance policy for a period of 15 years for a woman who is 35 years old.
Answer $______

5. What is the semi-annual premium for a $12,000 straight life insurance policy for a 25 year old person?
Answer $______

6. What is the premium for a $7,500 endowment policy payable at age 65? The policy is taken out by a man when he is 30 years old. Answer $______

11-6 EXERCISES B

1. John's father is 35 years old and just bought a house. He has a 10-year mortgage on it for $7,500. He wants to buy term insurance to cover the mortgage. How much will the premium be?

2. Bob Grimes is 30 and has three small children. Although he has a straight life policy, he wants more protection while the children are growing up. He buys $10,000 of 15-year term insurance. How much is the annual premium? __________

3. Mary's father, who is 35, just started a new stationery store. In order to do so, he had to borrow money. He needed some extra life insurance to cover the loan, and so he took out a 5-year term policy. If he pays a $63.00 premium annually, how much insurance will he have?

11-6 EXERCISES C:

4. When Ted Shields got his first job at 20, he took out $5,000 of straight life insurance. He paid the premium semi-annually, so how much was it? __________

5. After the first year, Ted decided to pay the premium annually. How much did he have to save each month in order to have the money on hand when the premium was due? __________

6. Judy just finished junior college and doesn't know whether to buy $2,000 worth of straight life insurance now or wait 5 years until she is 25. What would the difference in the annual premiums be if she waited?

7. Joe and his brother, Mike, each have a $10,000 straight life insurance policy. Joe purchased his when he was 20. Mike took his out when he was 30. What is Joe's annual premium? What is Mike's?

8. When Betty's father was 20, he bought $1,500 of straight life. At 25, he took out another $3,000 policy. Then, when he was 35, he added a $7,500 policy. How much are his total premiums each year? __________

11-6 EXERCISE D

9. Alice's father bought a $3,000 life paid up at 65 policy when he was 25. How much is his premium each year?

10. Miss Cox has a 20 payment life insurance policy that she bought when she was 20 years old. Her premium is $100.50 a year. How much insurance does she have?

11. Bill's father wants to buy $7,500 of limited-payment life insurance. He is now 35. How much will his premium be if he selects the life paid-up at 65 plan? How much if he chooses the 20-payment plan?

12. George Kent, 25, can afford $260 a year for life insurance. His agent suggests a life paid up at 65 policy. How much protection will George be able to buy with that?

11-6 EXERCISE E

13. Martha Brown, age 25, always wanted to take a trip around the world. Her problem was how to save enough money for such a big vacation. She finally decided to buy a 20-year endowment policy for $5,000. How much is her annual premium?

14. When Ben Martin's son was born, Ben, who was 25, bought a 20-year endowment policy to give his son $2,000 to help pay college costs or help him on his career. How much is the premium?

15. Ben also bought a $5,000 endowment policy for himself, payable at age 65. When he bought the policy, he was 25. How much is his annual premium?

11-6 EXERCISES F: Find the annual premium on each of the following:

1. $12,000 policy at $56.30 per $1000. ______
2. $ 7,500 at $45.73 per $1000. ______
3. $ 3,750 at $47.54 per $1000. ______
4. $13,250 at $50.80 per $1000. ______
5. $11,000 at $51.83 per $1000. ______
6. $25,000 at $43.32 per $1000. ______
7. $10,000 at $15.23 per $1000. ______
8. $15,000 at $25.14 per $1000. ______
9. $20,000 at $17.63 per $1000. ______
10. $40,000 at $19.85 per $1000. ______

11-6 EXERCISES G: Using table _____ find the premiums for the following:

Face of Policy	Type of Policy	Age	Premium per $1000	Annual Premium
1. $ 5,000	Straight Life	25	______	______
2. $10,000	Endowment at age 60	30	______	______
3. $12,000	20 year payment	35	______	______
4. $ 8,000	10 year term	25	______	______
5. $15,000	20 year endowment	30	______	______
6. $ 7,000	Straight Life	20	______	______

	Face of Policy	Type of Policy	Age	Premium per $1000	Annual Premium
7.	$20,000	20 year payment	40	________	______
8.	$50,000	20 year term	35	________	______
9.	$25,000	Straight Life	40	________	______
10.	$13,000	Straight Life	30	________	______

11-6 EXERCISES H

1. The annual dividends on my New York Life Insurance Company policy are $4.16 per $1000. What would the dividends be on a $5000 policy? What would the dividends be on a policy for $12,500?

2. If you take out a 20 payment life insurance policy at age 25, at what age will the insurance be paid up? How much will you pay in premiums during 20 years on $1000?

3. Find the premiums for the following at age 20.

	on $1000	on $5000	on $10,000	on $20,000
10 year term				
15 year term				
Straight life				
20 payment life				
Life paid-up at 65				
Twenty year endowment				
Endowment at 65				

11-7 Automobile Insurance

When you take the driver's education course, you will learn that the car you drive must be covered by automobile insurance.

The rates for different kinds of automobile insurance vary with the horsepower of the car, the model of the car, the size of the city in which you live, the number of past accidents in the locality, the distance travelled, the number of accidents of the insured owner and driver, the age of the driver, and the number of cars insured under the same policy.

There are several kinds of automobile insurance:

1. Liability insurance protects the automobile owner, if he is sued for damaging some other car or property, or for killing or injuring someone with his car. The premium is based upon the amount for which a person may be sued for damage to property or life.

2. Comprehensive insurance protects the owner against loss from fire, wind, or hail. The premium is based on the value of the car.

3. Collision insurance protects the owner against damage to his own car in a collision. The insurance is quoted on the basis of deductible collision, whereby, the owner pays the first $50 or $100 of costs and the insurance pays the balance of the cost of damages. The premium is based on the value of the car. Insurance rates are quoted annually, but may be paid semi-annually or quarterly.

The following charts show the premiums for given conditions. If you live in Hartford, your rates are shown in chart TERR. 11. Rates will be somewhat lower for residents of Windsor and surrounding towns.

On chart TERR. 11

class 1A family car not regularly used to go to & from work for all drivers except male drivers under 25

class 1B car used for work for distances less than 10 miles each way..drivers over 25

class 1C car used for work distance more than 10 miles each way..drivers over 25

class 2A family car driven by male driver under 25

class 2B family car driven by married male driver under 25

class 2C car owned and driven by male driver under 25

class 3 business use - essential to operator's occupation (salesman)

sub-class 0 - premium with no accidents
1 - premium with one accident
2 - premium with two accidents
3 - premium with three accidents
4 - premium with four accidents

Bodily injury: 10/20 $10,000 for injury to one person; $20,000 to two or more

50/100 $50,000 for injury to one person; $100,000 to two or more

Property damage: $5,000 or $10,000 damage

On chart TERR .01

a) Sym refers to the size of the car: 1 is a small car, 2 larger car, 3 medium car such as Ford, Plymouth, Chevrolet standard models, to 7, large car, such as Cadillac or Lincoln.

b. Age group refers to age of car - 1 means 1 year old, 2 means 2 years old, 3 means 3 years old and 4 means 4 years old.

c. Comprehensive full coverage means that the insurance company will pay for all damages due to theft, fire, wind, and hail. $50 deductible means that the insured pays for the first $50. damage and the insurance company pays for costs more than $50. The numbers 1, 1*, 2A, 2B, 2C, and 3 mean the same as listed previously.

Insurance premiums for comprehensive insurance and collision are based on the value of the car depending upon the size and age of the car.

* Refers to compact car.

If two or more cars are insured under the same policy, a 20% discount on liability and medical payments, and 10% on collision is allowed on all class 1 cars.

If you have had driver training, a 10% discount is allowed on liability and collision rates.

CONNECTICUT TERRITORIES

First Number shown indicates Territory for Liability Insurance.
Second Number shown indicates Territory for Physical Damage.

TOWN	TERR.	TOWN	TERR.	TOWN	TERR.	TOWN	TERR.
Addison	20 01	Georgetown	17 02	Niantic	24 96	Southport	26 02
Ansonia	21 03	Glastonbury	20 01	Noank	23 96	So. Windsor	20 01
Avon	20 01	Glenbrook	31 02	Norfolk	24 96	Springdale	31 02
Beacon Falls	18 03	Glenville	30 02	Noroton	30 02	Stafford	24 96
Bethany	21 03	Granby	20 01	No.Branford	21 03	StafrdSprngs	24 96
Berlin	20 01	GreenfldHill	26 02	NoGrsvnrdale	24 96	Stamford	31 02
Bethel	17 02	Greens Farms	28 02	North Haven	33 03	Sterling	24 96
Bloomfield	19 01	Greenwich	30 02	No.Stamford	31 02	Stonington	24 96
Branford	21 03	Groton	23 96	NoStonington	24 96	Stony Creek	21 03
Bridgeport	25 02	Guilford	21 03	Norwalk	27 02	Stratford	26 02
Bristol	20 01	Haddam	24 96	Norwich	23 96	Suffield	20 01
Broad Brook	20 01	Hamden	33 03	Oakville	14 14	Taftville	23 96
Brookfield	17 02	Hartford	11 01	OldGreenwich	30 02	Terryville	24 96
Brooklyn	24 96	Harwinton	24 96	Old Mystic	24 96	Thomaston	24 96
Burlington	20 01	Hazardville	20 01	Old Saybrook	24 96	Thompson	24 96
Burnside	19 01	Hebron	24 96	Orange	33 03	Thompsnville	20 01
Byram	30 02	Higganum	24 96	Oxford	18 03	Tolland	24 96
Canaan	24 96	Hockanum	19 01	Plainfield	24 96	Torrington	23 96
Canton	20 01	Huntington	17 02	Plainville	20 01	Trumbull	17 02
CntrlVillage	24 96	Jewett City	24 96	Plantsville	20 01	Uncasville	24 96
Cheshire	21 03	Kensington	20 01	Plymouth	24 96	Unionville	20 01
Chester	24 96	Kent	24 96	Pomfret	24 96	Vernon	24 96
Clinton	24 96	Killingly	24 96	Poquonock	19 01	Wallingford	21 03
Colchester	24 96	Lakeville	24 96	Portland	24 96	Wapping	20 01
Collinsville	20 01	Lebanon	24 96	Preston	24 96	WarehousePt.	20 01
Cornwall	24 96	Ledyard	24 96	Prospect		Washington	24 96
Cos Cob	30 02	Lisbon	24 96	(Mdlsx Co.)	24 96	Waterbury	14 14
Coventry	24 96	Litchfield	24 96	(N.H. Co.)	18 03	Waterford	23 96
Cresc.Beach	24 96	Lyme	24 96	Putnam	24 96	Watertown	14 14
Cromwell	24 96	Madison	21 03	Redding	17 02	Waterville	14 14
Danbury	17 02	Manchester	20 01	Ridgefield	17 02	Westbrook	24 96
Danielson	24 96	Mansfield	24 96	Riverside	30 02	W. Cornwall	24 96
Darien	30 02	Marlborough	20 01	Rockville	24 96	W. Hartford	19 01
Dayville	24 96	Meriden	21 03	Rocky Hill	20 01	West Haven	33 03
Deep River	24 96	Mianus	30 02	Romford	24 96	West Morris	24 96
Derby	21 03	Middlebury	14 14	Rowayton	27 02	West Mystic	23 96
Durham	24 96	Middlefield	24 96	Salisbury	24 96	Weston	17 02
East Granby	20 01	Middletown	24 96	Sandy Hook	17 02	Westport	28 02
East Haddam	24 96	Milford	33 03	Saugatuck	28 02	W. Suffield	20 01
East Hampton	24 96	Monroe	17 02	Saybrook	24 96	Wethersfield	19 01
E. Hartford	19 01	Montowese	33 03	Seymour	21 03	Willimantic	24 96
East Haven	33 03	Montville	24 96	Sharon	24 96	Willington	24 96
E. Killingly	24 96	Moodus	24 96	Shelton	17 02	Wilton	17 02
East Lyme	24 96	Moosup	24 96	Sherman	17 02	WinchstrCntr	24 96
East Norwalk	27 02	Mt. Carmel	33 03	Shippan Pt.	31 02	Windham	24 96
Easton	17 02	Mystic	24 96	Simsbury	20 01	Windsor	19 01
East Windsor	20 01	Naugatuck	14 14	Somers	24 96	WindsorLocks	20 01
E.WindsrHill	20 01	New Britain	15 01	Somersville	24 96	Winnipauk	27 02
Ellington	24 96	New Canaan	17 02	Sound View	24 96	Winsted	24 96
Enfield	20 01	New Hartford	24 96	Southbury	18 03	Wolcott	18 03
Essex	24 96	New Haven	32 03	So. Coventry	24 96	Woodbridge	21 03
Fairfield	26 02	Newington	19 01	So.Glstnbury	20 01	Woodbury	24 96
Fair Haven	32 03	New London	23 96	Southington	20 01	Woodmont	33 03
Farmington	20 01	New Milford	24 96	So.Manchester	20 01	Woodstock	24 96
Forestville	20 01	Newtown	17 02	So. Norwalk	27 02	Yalesville	21 03

TERR. 11 LIABILITY **TERR. 11**

SUB-CLASS	CLASS	BODILY INJURY						PROPERTY DAMAGE		MED. PAY. TABLE
		10/20	20/20	20/40	25/50	50/100	100/300	5000	10000	NOTE
MANUAL	1-A	91.	98.28	104.65	108.29	118.30	128.31	36.	37.80	19
	1-B	105.	113.40	120.75	124.95	136.50	148.05	41.	43.05	19
	1-C	105.	113.40	120.75	124.95	136.50	148.05	41.	43.05	19
	2-A	159.	171.72	182.85	189.21	206.70	224.19	63.	66.15	37
	2-B	137.	147.96	157.55	163.03	178.10	193.17	54.	56.70	31
	2-C	264.	285.12	303.60	314.16	343.20	372.24	104.	109.20	61
	3	137.	147.96	157.55	163.03	178.10	193.17	54.	56.70	31
0	1-A	77.	83.16	88.55	91.63	100.10	108.57	31.	32.55	20
	1-B	89.	96.12	102.35	105.91	115.70	125.49	35.	36.75	20
	1-C	89.	96.12	102.35	105.91	115.70	125.49	35.	36.75	20
	2-A	135.	145.80	155.25	160.65	175.50	190.35	54.	56.70	38
	2-B	116.	125.28	133.40	138.04	150.80	163.56	46.	48.30	32
	2-C	224.	241.92	257.60	266.56	291.20	315.84	88.	92.40	62
	3	116.	125.28	133.40	138.04	150.80	163.56	46.	48.30	32
1	1-A	96.	103.68	110.40	114.24	124.80	135.36	38.	39.90	21
	1-B	110.	118.80	126.50	130.90	143.00	155.10	43.	45.15	21
	1-C	110.	118.80	126.50	130.90	143.00	155.10	43.	45.15	21
	2-A	167.	180.36	192.05	198.73	217.10	235.47	66.	69.30	39
	2-B	144.	155.52	165.60	171.36	187.20	203.04	57.	59.85	33
	2-C	277.	299.16	318.55	329.63	360.10	390.57	109.	114.45	63
	3	144.	155.52	165.60	171.36	187.20	203.04	57.	59.85	33
2	1-A	137.	147.96	157.55	163.03	178.10	193.17	54.	56.70	22
	1-B	158.	170.64	181.70	188.02	205.40	222.78	62.	65.10	22
	1-C	158.	170.64	181.70	188.02	205.40	222.78	62.	65.10	22
	2-A	239.	258.12	274.85	284.41	310.70	336.99	95.	99.75	40
	2-B	206.	222.48	236.90	245.14	267.80	290.46	81.	85.05	34
	2-C	396.	427.68	455.40	471.24	514.80	558.36	156.	163.80	64
	3	206.	222.48	236.90	245.14	267.80	290.46	81.	85.05	34
3	1-A	182.	196.56	209.30	216.58	236.60	256.62	72.	75.60	23
	1-B	210.	226.80	241.50	249.90	273.00	296.10	82.	86.10	23
	1-C	210.	226.80	241.50	249.90	273.00	296.10	82.	86.10	23
	2-A	318.	343.44	365.70	378.42	413.40	448.38	126.	132.30	41
	2-B	274.	295.92	315.10	326.06	356.20	386.34	108.	113.40	35
	2-C	528.	570.24	607.20	628.32	686.40	744.48	208.	218.40	65
	3	274.	295.92	315.10	326.06	356.20	386.34	108.	113.40	35
4	1-A	228.	246.24	262.20	271.32	296.40	321.48	90.	94.50	24
	1-B	263.	284.04	302.45	312.97	341.90	370.83	103.	108.15	24
	1-C	263.	284.04	302.45	312.97	341.90	370.83	103.	108.15	24
	2-A	398.	429.84	457.70	473.62	517.40	561.18	158.	165.90	42
	2-B	343.	360.44	394.45	408.17	445.90	483.63	135.	141.75	36
	2-C	660.	712.80	759.00	785.40	858.00	930.60	260.	273.00	66
	3	343.	360.44	394.45	408.17	445.90	483.63	135.	141.75	36

■ MEDICAL PAYMENTS - See Table, Page 16.
PHYSICAL DAMAGE - Use Terr. 01, Page 18.
TWO OR MORE AUTOS - See Table, Page 17.
Property Damage, $25,000: Multiply
$5,000 Premium by 1.08.

TERR. 01 PHYSICAL DAMAGE

MANUAL

SYMB	AGE GRP	COMPREH		COLLISION									
		FULL COV	$50 DED	$50 DEDUCTIBLE					$100 DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	58	52	99	131	73	32	29	54	72	40
	2 & 3	9	4	51	46	87	115	64	28	25	48	63	35
	4	6	3	44	40	75	99	55	24	22	41	54	30
2 (H-I)	1	12	5	69	62	117	155	86	45	41	77	101	56
	2 & 3	10	4	61	55	104	137	76	40	36	68	90	50
	4	7	3	52	47	88	117	65	34	31	58	77	43
3 (J-K)	1	15	6	81	73	138	182	101	56	50	95	126	70
	2 & 3	12	5	71	64	121	160	89	49	44	83	110	61
	4	9	4	61	55	104	137	76	42	38	71	95	53
4 (L-M)	1	18	8	93	84	158	209	116	66	59	112	149	83
	2 & 3	15	6	81	73	138	182	101	58	52	99	131	73
	4	11	5	70	63	119	158	88	50	45	85	113	63
5 (N-O)	1	23	10	107	96	182	241	134	77	69	131	173	96
	2 & 3	20	8	93	84	158	209	116	67	60	114	151	84
	4	14	6	80	72	136	180	100	58	52	99	131	73
6 (P-S)	1	29	12	119	107	202	268	149	86	77	146	194	108
	2 & 3	25	10	104	94	177	234	130	76	68	129	171	95
	4	18	7	89	80	151	200	111	65	59	111	146	81
7 (T-Z)	1	37	15	130	117	221	293	163	95	86	162	214	119
	2 & 3	32	13	113	102	192	254	141	83	75	141	187	104
	4	22	9	97	87	165	218	121	71	64	121	160	89

SUB-CLASS

0

SYMB.	AGE GRP	COMPREH.		COLLISION									
		FULL COV	$50 DED	$50. DEDUCTIBLE					$100. DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	49	44	84	111	62	27	24	46	61	34
	2 & 3	9	4	43	39	74	98	54	24	22	41	54	30
	4	6	3	37	33	64	84	47	20	18	35	46	26
2 (H-I)	1	12	5	59	53	99	132	73	38	34	65	86	48
	2 & 3	10	4	52	47	88	116	65	34	31	58	77	43
	4	7	3	44	40	75	99	55	29	26	49	65	37
3 (J-K)	1	15	6	69	62	117	155	86	48	43	81	107	60
	2 & 3	12	5	60	54	103	136	76	42	38	71	94	52
	4	9	4	52	47	88	116	65	36	32	60	81	45
4 (L-M)	1	18	8	79	71	134	178	99	56	50	95	127	71
	2 & 3	15	6	69	62	117	155	86	49	44	84	111	62
	4	11	5	60	54	101	134	75	43	39	72	96	54
5 (N-O)	1	23	10	91	82	155	205	114	65	59	111	147	82
	2 & 3	20	8	79	71	134	178	99	57	51	97	128	71
	4	14	6	68	61	116	153	85	49	44	84	111	62
6 (P-S)	1	29	12	101	91	172	228	127	73	66	124	165	92
	2 & 3	25	10	88	79	150	199	111	65	59	110	145	81
	4	18	7	76	68	128	170	94	55	50	94	124	69
7 (T-Z)	1	37	15	111	100	188	249	139	81	73	138	182	101
	2 & 3	32	13	96	86	163	216	120	71	64	120	159	88
	4	22	9	82	74	140	185	103	60	54	103	136	76

SUB-CLASS

1

SYMB.	AGE GRP.	COMPREH.		COLLISION									
		FULL COV	$50 DED.	$50. DEDUCTIBLE					$100. DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	61	55	104	138	77	34	31	57	76	42
	2 & 3	9	4	54	49	91	121	67	29	26	50	66	37
	4	6	3	46	41	79	104	58	25	23	43	57	32
2 (H-I)	1	12	5	72	65	123	163	90	47	42	81	106	59
	2 & 3	10	4	64	58	109	144	80	42	38	71	95	53
	4	7	3	55	50	92	123	68	36	32	61	81	45
3 (J-K)	1	15	6	85	77	145	191	106	59	53	100	132	74
	2 & 3	12	5	75	68	127	168	93	51	46	87	116	64
	4	9	4	64	58	109	144	80	44	40	75	100	56
4 (L-M)	1	18	8	98	88	166	219	122	69	62	118	156	87
	2 & 3	15	6	85	77	145	191	106	61	55	104	138	77
	4	11	5	74	67	125	166	92	53	48	89	119	66
5 (N-O)	1	23	10	112	101	191	253	141	81	73	138	182	101
	2 & 3	20	8	98	88	166	219	122	70	63	120	159	88
	4	14	6	84	76	143	189	105	61	55	104	138	77
6 (P-S)	1	29	12	125	113	212	281	156	90	81	153	204	113
	2 & 3	25	10	109	98	186	246	137	80	72	135	180	100
	4	18	7	93	84	159	210	117	68	61	117	153	85
7 (T-Z)	1	37	15	137	123	232	308	171	100	90	170	225	125
	2 & 3	32	13	119	107	202	267	148	87	78	148	196	109
	4	22	9	102	92	173	229	127	75	68	127	168	93

1* shows Class 1 premiums reduced by 10%, rounded to nearest dollar. Use for 2 or More Autos, D.T. or Compact Car Credit.

PHYSICAL DAMAGE TERR. 01

SUB-CLASS

2

SYMB	AGE GRP	COMPREH		COLLISION									
		FULL COV	$50 DED	$50 DEDUCTIBLE					$100. DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	87	78	149	197	110	48	43	81	108	60
	2 & 3	9	4	77	69	131	173	96	42	38	72	95	53
	4	6	3	66	59	113	149	83	36	32	62	81	45
2 (H-I)	1	12	5	104	94	176	233	129	68	61	116	152	84
	2 & 3	10	4	92	83	156	206	114	60	54	102	135	75
	4	7	3	78	70	132	176	98	51	46	87	116	65
3 (J-K)	1	15	6	122	110	207	273	152	84	76	143	189	105
	2 & 3	12	5	107	96	182	240	134	74	67	125	165	92
	4	9	4	92	83	156	206	114	63	57	107	143	80
4 (L-M)	1	18	8	140	126	237	314	174	99	89	168	224	125
	2 & 3	15	6	122	110	207	273	152	87	78	149	197	110
	4	11	5	105	95	179	237	132	75	68	128	170	95
5 (N-O)	1	23	10	161	145	273	362	201	116	104	197	260	144
	2 & 3	20	8	140	126	237	314	174	101	91	171	227	126
	4	14	6	120	108	204	270	150	87	78	149	197	110
6 (P-S)	1	29	12	179	161	303	402	224	129	116	219	291	162
	2 & 3	25	10	156	140	266	351	195	114	103	194	257	143
	4	18	7	134	121	227	300	167	98	88	167	219	122
7 (T-Z)	1	37	15	195	176	332	440	245	143	129	243	321	179
	2 & 3	32	13	170	153	288	381	212	125	113	212	281	156
	4	22	9	146	131	248	327	182	107	96	182	240	134

SUB-CLASS

3

SYMB	AGE GRP	COMPREH.		COLLISION									
		FULL COV	$50 DED	$50. DEDUCTIBLE					$100 DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	116	104	198	262	146	64	58	108	144	80
	2 & 3	9	4	102	92	174	230	128	56	50	96	126	70
	4	6	3	88	79	150	198	110	48	43	82	108	60
2 (H-I)	1	12	5	138	124	234	310	172	90	81	154	202	112
	2 & 3	10	4	122	110	208	274	152	80	72	136	180	100
	4	7	3	104	94	176	234	130	68	61	116	154	86
3 (J-K)	1	15	6	162	146	276	364	202	112	101	190	252	140
	2 & 3	12	5	142	128	242	320	178	98	88	166	220	122
	4	9	4	122	110	208	274	152	84	76	142	190	106
4 (L-M)	1	18	8	186	167	316	418	232	132	119	224	298	166
	2 & 3	15	6	162	146	276	364	202	116	104	198	262	146
	4	11	5	140	126	238	316	176	100	90	170	226	126
5 (N-O)	1	23	10	214	193	364	482	268	154	139	262	346	192
	2 & 3	20	8	186	167	316	418	232	134	121	228	302	168
	4	14	6	160	144	272	360	200	116	104	198	262	146
6 (P-S)	1	29	12	238	214	404	536	298	172	155	292	388	216
	2 & 3	25	10	208	187	354	468	260	152	137	258	342	190
	4	18	7	178	160	302	400	222	130	117	222	292	162
7 (T-Z)	1	37	15	260	234	442	586	326	190	171	324	428	238
	2 & 3	32	13	226	203	384	508	282	166	149	282	374	208
	4	22	9	194	175	330	436	242	142	128	242	320	178

SUB-CLASS

4

SYMB.	AGE GRP	COMPREH.		COLLISION									
		FULL COV	$50 DED	$50. DEDUCTIBLE					$100. DEDUCTIBLE				
				1	1*	2A	2C	2B,3	1	1*	2A	2C	2B,3
1 (A-G)	1	10	4	145	131	248	328	183	80	72	135	180	100
	2 & 3	9	4	128	115	218	288	160	70	63	120	158	88
	4	6	3	110	99	188	248	138	60	54	103	135	75
2 (H-I)	1	12	5	173	156	293	388	215	113	102	193	253	140
	2 & 3	10	4	153	138	260	343	190	100	90	170	225	125
	4	7	3	130	117	220	293	163	85	77	145	193	108
3 (J-K)	1	15	6	203	183	345	455	253	140	126	238	315	175
	2 & 3	12	5	178	160	303	400	223	123	111	208	275	153
	4	9	4	153	138	260	343	190	105	95	178	238	133
4 (L-M)	1	18	8	233	210	395	523	290	165	149	280	373	208
	2 & 3	15	6	203	183	345	455	253	145	131	248	328	183
	4	11	5	175	158	298	395	220	125	113	213	283	158
5 (N-O)	1	23	10	268	241	455	603	335	193	174	328	433	240
	2 & 3	20	8	233	210	395	523	290	168	151	285	378	210
	4	14	6	200	180	340	450	250	145	131	248	328	183
6 (P-S)	1	29	12	298	268	505	670	373	215	194	365	[illegible]	[illegible]
	2 & 3	25	10	260	234	443	585	325	190	171	323	[illegible]	[illegible]
	4	18	7	223	201	378	500	278	163	147	[illegible]	[illegible]	[illegible]
7 (T-Z)	1	37	15	325	293	553	733	408	238	214	[illegible]	[illegible]	[illegible]
	2 & 3	32	13	283	255	480	635	353	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	4	22	9	243	219	413	545	303	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1* shows Class 1 premiums reduced by 10%, ro[illegible] dollar. Use for 2 or More Autos, D.[illegible] or [illegible]

411

11-7 EXERCISES A: Use tables 11 and 01 for annual premiums.

1. Mr. Lewis who lives in Hartford owns a 1966 Chevrolet. Mr. Lewis, his wife and 17 year old son drive the family car. Mr. Lewis does not use the car to drive to and from work. What are the premiums for liability insurance, for bodily injury at 50/100 ($50,000 for injury or death to one person, $100,000 for injury or death to two or more persons), and $10,000 property damage? (class 2A)

Liability	Manual	Number of Accidents				
		none	one	two	three	four
Bodily injury	______	____	___	___	_____	____
Property damage	______	____	___	___	_____	____
Total liability	______	____	___	___	_____	____

2. Jim Grant, who is 21, owns his own 1965 Buick Convertible (class 2C) what are the premiums for liability insurance at 25/50 for bodily injury and $10,000 property damage?

Liability	Manual	Number of Accidents				
		none	one	two	three	four
Bodily injury	______	____	___	___	_____	____
Property damage	______	____	___	___	_____	____
Total liability	______	____	___	___	_____	____

3. Mr. Mason and his wife and his 19 year old daughter Susan drive the family car, a 1965 Pontiac. What are the premiums on liability insurance at 20/40 for bodily injury and $10,000 property damage?

Liability	Manual	Number of Accidents				
		none	one	two	three	four
Bodily injury						
Property damage						
Total						

4. Mr. Wilson uses his Cadillac to drive to and from work, a distance of 8 miles each way. He carries liability insurance for bodily injury at 100/300. and for property damage of $10,000. What are his premiums if he has never had an accident?

5. Francis Smith, over 25 (class 1) has $100 deductible collision insurance and comprehensive full coverage on her 1965 Plymouth. What are the premiums for full coverage comprehensive insurance and $100 deductible collision insurance. (Use chart 01 manual)

6. Bill Moore, age 24 married, (2B), owns a 1966 Rambler (sym 2). What are the premiums for full coverage comprehensive and $50 deductible collision insurance? Complete this chart:

Physical Damage	Manual	Number of Accidents				
		none	one	two	three	four
Compreh. Full Cov.						
Collision $50 Deductible						
$100 Deductible						

7. Mr. Thomas, owns a 1967 Ford Mustang, (sym 3), his son Albert, age 22, drives it, (class 2A). Find the premiums for full coverage comprehensive and $50 deductible collision insurance. Complete this chart:

Physical Damage	Manual	Number of Accidents none	one	two	three	four
Compreh. Full Cov.	_____	_____	_____	_____	_____	_____
Collision $50 Deductible	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

8. The owner of a 1966 Plymouth Fury II (class 3) valued at $2700, living in Hartford used the car to travel to and from work a distance less than 10 miles. It was insured for personal liability 50/100, property damage $10,000, full comprehensive coverage and $50 deductible collision. There were two drivers, an adult over 25 and a fellow under 25. What was the annual premium with no accidents? (Use charts 11 and 01) Find the semi-annual premium.

9. John Somme, age 24 who lives in Hartford, owns and drives a 1965 Volkswagen. He has had no accidents. Show the annual premiums that he must pay for the following insurance coverage.

Liability - bodily injury 25/50 __________

Liability - property damage $10,000 __________

Full coverage comprehensive __________

$50 deductible collision __________

Total premium __________

10. What is the cost of comprehensive insurance on a car valued at $1500 at $.79 per $100?

11. Mr. Small paid $94 for $50 deductible collision insurance. The cost of repairing his car after an accident was $239.75. How much did he receive from his collision insurance?

12. Mr. Barron's car was stolen and not recovered. He carried $2100 comprehensive full coverage insurance on his car. The insurance covered only 80% of the cost of a new car of the same make as the one stolen. How much did he have to add to the insurance money to buy a new car?

13. Find the total premium of insurance on Mr. Davis' car valued at $1750 against the following risks: public liability $163.80, collision $78, and comprehensive at $1.58 per $100 value of car.

14. Since Mr. Thomson had no car accident during the year, the insurance company reduced the premium the next year. His new premium was 87½% of the previous year which was $127. What is his present premium? How much more did he pay last year than this year?

15. Howard Cooper bought a new Chevrolet Corvair for $2615. He insured it for 90% of its value against fire and theft at 64¢ per $100; property damage cost him $135.72, personal liability cost $343.28 and $50 deductible collision insurance cost $234. Find the total annual premium.

16. Gil bought a used 1963 Chevrolet for $1200 and insured it for full value. The personal liability insurance cost him $315.10, property damage $113.40, comprehensive $15, $50 deductible collision $252. What did the insurance cost per year? He was involved in an accident which damaged his car to the extent of $265.50 and the other car to the extent of $478.00. He had to pay for the damage to both cars.

a) How much money did his insurance company have to pay.

b) Did he save by having insurance? If so, how much?

11-8 Home Protection Insurance

A home protection insurance policy protects the home owner from loss or damage to his home caused by fire, water damage, and breakage made by firemen while fighting a fire. A policy may cover the contents of the home such as, furniture, clothing and other valuables. Some policies provide additional living expenses to pay for a place to live while the house is being reconditioned. Home protection insurance covers damage by wind, hail, explosion due to accumulated gases or unconsumed fuel, smoke damage due to faulty operation of heating or cooking units, damage caused by the crash of a car or aircraft into the house, and damage caused by riots, vandalism, or theft of personal property.

Premiums vary according to the coverage, such as, location of the house, distance from fire hydrant, distance from the fire engine house, construction of the building, frame or brick, type of roof, single or multiple dwelling (several families,) store, garage, or other industrial constructions.

The following charts are issued to determine the premium of your home protection policy. Notice on the basic premium chart, page 419 Hartford county, which includes the city of Hartford and towns surrounding it, are in zone II. Hartford and West Hartford are in class A because all residences are within 500 or 1000 feet from the fire hydrant, and less than 3 miles from a fire station. On page 419 chart 11 shows premiums for a brick house (masonry) and chart 12 shows premiums for a frame house.

Form 1 is limited to only specifically stated in the declaration.

Form 2 provides more extensive coverage.

Form 3 with 4 covers the most extensive losses, all losses covered by form 1 and form 2 as well as such items as payment of expenses involved if someone is injured on your property.

Notice that the premium is paid in advance for a three year period.

11-8 EXERCISES A:

1. If the house in which you live is a frame house valued for $8500., what is the premium for 3 years if covered for loss by fire? (Form 1)

2. Mr. Brown's home had shingles torn from the roof during a windstorm. It cost him $450 to replace the shingles on the roof. His brick house was valued at $17,500 and was covered under form 2, no. 1. What was his premium for three years? How much did he save by having home protection insurance?

3. Mr. Blake had his $35 raincoat stolen at work. He had a home protection policy form 3 no. 1, so his loss was covered. What was his three year premium, if his policy covered his frame house valued at $32,500.

4. While Mr. and Mrs. Graham were shopping, their home was broken into. A radio, camera, bank books, stocks and bonds, some clothing and jewelry were stolen. The bank books, stocks and bonds were recovered. The other items valued at $640 were covered by insurance. They carried form 2 no. 1 and no. 2 on their frame home, which was valued at $25,000. What was their premium for 3 years? How much did they save by carrying home protection insurance?

CONNECTICUT

TERRITORIAL PAGES

PART II — BASIC PREMIUM CHARTS

Zone I — Entire State except Fairfield, Hartford and New Haven Counties.

Zone II — Fairfield, Hartford, New Haven Counties.

PREMIUM GROUP CHARTS

Protection Class	Fire Hydrant	FORMS 1, 2, 3 with 4 Zone I Masonry	Zone I Frame	Zone II Masonry	Zone II Frame	FORM 5 Zone I-II Masonry	FORM 5 Zone I-II Frame
(A)							
	Within 500 ft.	1	2	11	12	1	2
	Within 1000 ft.	3	4	13	14	3	4
	Over 1000 ft. within 3 mi.	5	6	15	16	5	6
	Over 1000 ft. over 3 mi.	9	10	19	20	9	10
(B)							
	Within 500 ft.	3	4	13	14	3	4
	Within 1000 ft.	3	4	13	14	3	4
	Over 1000 ft. within 3 mi.	7	8	17	18	7	8
	Over 1000 ft. over 3 mi.	9	10	19	20	9	10
(C)							
	Within 500 ft.	3	4	13	14	3	4
	Within 1000 ft.	5	6	15	16	5	6
	Over 1000 ft. within 3 mi.	7	8	17	18	7	8
	Over 1000 ft. over 3 mi.	9	10	19	20	9	10
(D)							
	Within 500 ft.	5	6	15	16	5	6
	Within 1000 ft.	7	8	17	18	7	8
	Over 1000 ft. within 3 mi.	7	8	17	18	7	8
	Over 1000 ft. over 3 mi.	9	10	19	20	9	10
(E)							
	Within 1000 ft.	7	8	17	18	7	8
	Over 1000 ft. within 3 mi.	7	8	17	18	7	8
	Over 1000 ft. over 3 mi.	9	10	19	20	9	10
	*See tab. on following page	5	6	15	16	5	6
	See tab. on following page	7	8	17	18	7	8
	See tab. on following page	7	8	17	18	7	8
(F)							
	All others (i.e. No Prot.)	9	10	19	20	9	10

Note: Construction — Definition of Terms

Masonry — A dwelling with walls of masonry or masonry veneered construction.

Frame — A dwelling with walls of frame or metal — sheathed or stuccoed frame construction, or with walls of metal or metal lath and plaster on combustible supports.

Mixed — A dwelling shall be classed as frame construction when the wall area of frame construction (including gables) exceeds 33⅓% of the total wall area.

CONNECTICUT — ZONE II

BASIC PREMIUM GROUP — 11

Three Year Prepaid Premium

Loss Deductible Clauses Applicable

Cov. A Dwelling	FORM 1 No. 1 and No. 2	FORM 1 No. 1	FORM 2 No. 1 and No. 2	FORM 2 Nos. 1 and Mod. 2	FORM 2 No. 1	FORM 3 with 4 No. 1 and No. 2	FORM 3 with 4 Nos. 1 and Mod. 2	FORM 3 with 4 No. 1
*$ 5,000	70	84	82	101	108	90	114	124
* 6,000	72	86	84	104	112	93	117	127
* 7,000	74	89	87	107	115	95	121	131
8,000	76	91	89	109	118	98	124	135
9,000	79	95	92	114	122	102	129	140
10,000	82	98	96	118	127	106	134	145
11,000	85	102	99	122	132	110	139	150
12,000	90	108	105	130	139	116	147	159
13,500	95	114	111	137	147	123	155	168
15,000	100	120	117	144	155	129	163	177
17,500	112	134	131	161	174	144	183	198
20,000	124	149	145	179	192	160	202	219
22,500	138	166	161	199	214	178	225	244
25,000	155	186	181	223	240	200	253	274
27,500	172	206	201	248	267	222	280	304
30,000	190	228	222	274	294	245	310	336
32,500	210	252	246	302	325	271	342	372
35,000	230	276	269	331	356	297	375	407
37,500	250	300	292	360	387	322	407	442
40,000	270	324	316	389	418	348	440	478
42,500	290	348	339	418	449	374	473	513
45,000	310	372	363	446	480	400	505	549
47,500	330	396	386	475	511	426	538	584
50,000	350	420	409	504	542	451	570	619
Each $5,000 up to $125,000-add	40	48	47	58	62	52	65	71

* Secondary Locations Only

BASIC PREMIUM GROUP — 12

Three Year Prepaid Premium

Loss Deductible Clauses Applicable

Cov. A Dwelling	FORM 1 No. 1 and No. 2	FORM 1 No. 1	FORM 2 No. 1 and No. 2	FORM 2 Nos. 1 and Mod. 2	FORM 2 No. 1	FORM 3 with 4 No. 1 and No. 2	FORM 3 with 4 Nos. 1 and Mod. 2	FORM 3 with 4 No. 1
*$ 5,000	78	93	91	112	121	101	127	137
* 6,000	80	96	94	115	125	104	130	141
* 7,000	82	98	96	118	128	107	134	145
8,000	84	101	99	122	131	109	138	149
9,000	88	105	103	126	137	114	143	155
10,000	91	109	107	131	142	118	148	161
11,000	94	113	110	136	147	122	154	167
12,000	100	120	117	144	156	130	163	176
13,500	105	126	123	152	164	137	172	186
15,000	111	133	130	160	173	144	181	196
17,500	124	149	146	179	194	161	203	220
20,000	138	165	161	198	215	179	224	243
22,500	153	184	179	221	239	199	250	270
25,000	172	206	201	248	268	223	281	304
27,500	191	229	224	275	298	248	311	337
30,000	211	253	247	304	329	274	344	372
32,500	233	279	273	336	363	302	380	412
35,000	255	306	299	368	398	331	416	451
37,500	277	332	325	400	432	360	452	490
40,000	300	359	351	432	467	389	489	529
42,500	322	386	377	464	502	418	525	568
45,000	344	412	403	496	536	446	561	608
47,500	366	439	429	528	571	475	597	647
50,000	388	465	455	560	605	504	633	686
Each $5,000 up to $125,000-add	44	53	52	64	69	58	72	78

5. Mr. Fredericks fell on the ice on the sidewalk and broke 4 ribs in front of Mr. Baker's home. Fortunately, Mr. Baker's property was insured under form 3 with 4. The policy for his $27,500 brick house included coverage for accidents on his property. Mr. Fredericks was hospitalized for several days and was unable to work for six weeks. Mr. Baker's home protection policy covered the $1,000 for medical expenses and loss of pay. How much was Mr. Bakers premiums for 3 years? How much did he save by having the home protection policy?

Sometimes premiums for fire insurance are quoted as a certain amount for each $100 worth of insurance.

Example: What is the annual premium on a house valued at $13,500 at $.74 per $100.

Solution:

13,500   100 = 135 hundreds

135 x $.74 = $99.90 premium for one year

11-8 EXERCISES B:

1. If the annual rate of fire insurance on your home is $.92 per $100., what is the annual premium, if the house is valued at $12,300?

2. Mr. Ace owns a house valued at $19,800. If it is insured for 80% of its value at the rate of $1.17 per $100., what is the insured value of the house, and what is the annual premium? If the annual premium is 35% of the three year premium, what is the 3 year premium?

3. What is the amount of the premium for three years on a house valued at $17,500 insured for one-half of its value at $2.68 per $100. for 3 years?

4. Find the total annual premium of the insurance for the following buildings: A brick house insured for $16,500 at $.74 per $100., and a frame house insured for $14,250 at $.97 per $100?

5. A merchant took out insurance on a store building valued at $75,000 and his stock of goods valued at $29,250. What is the premium at $1.15 per $100 on the building and $1.42 per $100 on the contents? If the store was damaged by fire to the extent of $6700 and the stock worth $5400, how much settlement will be made to the merchant?

6. A garage was covered by tornado insurance at the rate of $1.95 per $100. What was the amount of the premium on a policy for $42,500?

7. A one family frame house with shingle roof valued at $10,600 located in Hartford is covered by insurance at a premium of $138 for three years. What is the premium for 1 year? (35% of premium for 3 years) What is the rate per $100?

8. Mr. Bridges owned a store in a brick building at $42,500. He suffered fire damage amounting to $20,000 on the building and contents. He did not have any insurance. If he had had insurance (form 1 no. 1) how much would he have saved?

11-9 Property Tax

If you own property, a house, or land, or a car, you must pay property tax to the city or town where you live. The amount of tax is based on the valuation of the property and the expenditures for operating expenses of the town. The tax rate or mill rate is determined by dividing the operating cost by the value of the property in the town. The value placed on the property is an assessed valuation. Some towns use the assessed valuation as the price you could receive if you sold your home. Others use a per cent of this value, such as 60%, 75%, 80%, etc. The mill rate depends upon the amount of money needed in the town or city to pay for operating expenses, such as, schools, roads, street lighting, fire fighting, police protection, snow removal, welfare, care of parks and other recreational areas.

The tax rate is written several different ways:

1) as mills per dollar of valuation.

2) as a certain amount per $100.

3) as a certain amount per $1000.

To change from one form to the other:

1) Since there are 10 mills per cent, we can say 10 mills = .01 25 mills = .025; 36.4 mills = .0364; 49 3/4 mills = 49.75 mills = .04975, move the decimal point in mills three places to the left to change to cents per $1.00 tax.

2) Since the mill rate represents the number of cents tax per $1.00, the tax on $100 will be 100 times the mill rate per $1.00; to multiply by 100, move the decimal point two places to the right in the mill rate per $1.

3) To find the tax rate per $1000 move the decimal point in the mill rate per dollar, three places to the right.

4) To change to per cent, use the number of dollars per $100, and replace the dollar sign with the per cent sign. 49 3/4 mills = .04975 per $1.00 = $4.975 per $100 = $49.75 per $1000. = 4.975%

The following chart shows the Net Grand list, which is the total value of the property in each of the towns listed in 1964 and 1965. It also shows the assessment ratio (the % of the value of property taxed) and the mill rate of taxation for 1965 and 1966.

	Net Grand List		Assessment Ratio	Tax Rate Mills	
	1964	1965		1965	1966
Avon	$ 32,337,570	$ 34,822,280	60%	39.5	40.5
Bloomfield	90,595,356	94,579,932	60%	37.25	38.75
East Hartford	299,156,174	319,705,865	67%	30.9	30.4
Farmington	51,657,649	73,537,050	65%	49.0	38.0
Glastonbury	73,557,913	99,184,020	70%	43.0	37.5
Hartford	779,708,933	797,269,424	65%	47.5	49.9
Manchester	171,945,048	180,406,949	72%	42.6	42.6
New Britain	247,050,100	251,282,650	60%	49.4	53.5
Newington	112,803,810	121,781,260	65%	34.5	35.5
Simsbury	63,279,260	68,701,830	65%	37.75	37.75
South Windsor	77,454,875	83,885,175	80%	33.5	38.5
West Hartford	333,041,939	341,126,532	55%	44.5	46.5
Wethersfield	104,278,000	137,028,200	60%	41.5	35.8
Windsor	90,934,840	97,369,430	65%	35.8	38.0
Windsor Locks	66,818,739	69,820,039	60%	31.0	33.125

11-9 EXERCISE

Using the above table, find the increase in the Net Grand list for each of the towns and the per cent of increase based on the 1964 valuation: Find to nearest tenth of a per cent.

Example: $797,269,424 in 1965
$779,708,933 in 1964
Hartford $ 17,560,491

$$\frac{17,560,491.000}{779,708,933.} = .0225 = 2\tfrac{1}{4}\%$$

11-9 EXERCISES A: Complete the following table by filling in the correct forms of the rate.

	Mills per $1.00	Cents per $1.00	per $100	per $1000	Per cent
1.	38 mills				
2.	47.5 mills				
3.	52¼ mills				
4.		.0275			
5.		.035			
6.			$3.35		
7.			$1.925		
8.				$57.00	
9.				$45.50	
10.					2.8%
11.					3¼%
12.					4.375%

Finding property tax:

Example: Find the tax on property valued at $10,500 assessed at 60% of its market value, at the tax rate of 49.8 mills.

.60 x $10,500 = $6300

49.8 mills = .0498 per $1.00

Tax = .0498 x $6300 = $313.77

11-9 EXERCISES B: Find the tax to the nearest cent.

1. Our property in Hartford is assessed for $8,500. at 1967 mill rate of 52.4 mills; find the property tax.

2. Find the property tax on a house and lot assessed at $16,240 in Wethersfield at 35.8 mills.

3. Mr. Thompson owns a house in South Windsor valued at $28,500 and a car valued at $2450. His property is assessed at 80% of its market value. Find the tax on both his car and house at the rate of 38.5 mills.

4. Mr. Morrow owns a three family house in New Britain valued at $32,000 and two cars, one valued at $1760, the other at $620. His property is assessed at 60% of its value. Find the tax on his house and cars at the rate of 53.5 mills.

5. A house valued at $14,500 is assessed at 65% of its market value in Hartford where the tax rate is 52.4 mills. A similar house in South Windsor valued at $14,500 is assessed at 80% of its market value, where the tax rate is 38.5 mills. Find the tax on the house in Hartford. Find the tax on the house in South Windsor.

6. Find the tax on a garage assessed at $75,000 at a tax rate of 5.3%.

7. Find the total tax on the following:

Item	Assessed Valuation	Tax Rate	Annual Tax
House and lot	$21,430	3.8%	________
47 acre farm	$11,750	2.3%	________
Grocery store	$36,200	4.1%	________
Truck	$ 2,850	5.9%	________

8. In Monroeville the tax rate is $37.25 per $1000. Find the tax on property valued at $22,500.

9. Mr. Hoffman has a summer cottage at Otis, Massachusetts valued at $2,850. The tax rate is $4.25 per $100. Find the tax.

10. If the property tax increases from $1.90 to $2.50 per $100, how much will the taxes be increased on property assessed for $16,500?

Example 1: The "blue book" value of a 1963 Chevrolet $1500. Complete the following tax bill for Charles T. Cooper. The tax rate in Hartford in 1965 was 49.9 mills.

CITY OF HARTFORD **TAX BILL** **19** LIST **MOTOR VEHICLE**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office .... PRESENT COMPLETE BILL AND STUBS.
When making payment by mail .... SEND IN PROPER STUB.
If receipt is desired by mail .... INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

REG. NO.	YR. MAKE	CODE	IDENTIFICATION NO.	ACCOUNT NO.
678-148	"63" Chevy		68D33125	684356

TOTAL TAX DUE
74.85

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

OWNER
Cooper, Charles T.
256 Wethersfield Avenue
Hartford, Connecticut, 06810

ALL OWNERS OF MOTOR VEHICLES WHOSE CONN. REGISTRATIONS WERE NOT CANCELLED PRIOR TO JULY 1, 1965 ARE LIABLE FOR THIS TAX. AUTO TAXES CANNOT BE PRORATED FOR A PORTION OF THE YEAR

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate
1,500.00	---	1,500.00	49.9

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967
$18.71	$18.71	$18.71	$18.72

11-9 EXERCISES C

1. Raymond Miller bought a 1966 Chevrolet for $2109.58. The Blue Book value is $1800. Compute his tax from the information provided on the Tax Bill Form:

CITY OF HARTFORD **TAX BILL** **19** LIST **MOTOR VEHICLE**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office .... PRESENT COMPLETE BILL AND STUBS.
When making payment by mail .... SEND IN PROPER STUB.
If receipt is desired by mail .... INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

REG. NO.	YR. MAKE	CODE	IDENTIFICATION NO.	ACCOUNT NO.
REGM	66 Chevy		J9TW4568	68056

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

OWNER
Miller, Raymond G.
146 Clover Street
Hartford, Connecticut

ALL OWNERS OF MOTOR VEHICLES WHOSE CONN. REGISTRATIONS WERE NOT CANCELLED PRIOR TO JULY 1, 1965 ARE LIABLE FOR THIS TAX. AUTO TAXES CANNOT BE PRORATED FOR A PORTION OF THE YEAR.

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate
1800		1800	49.9

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

2. Miss Nancy Jaffy owns a 1965 Thunderbird whose Blue Book value is $3700. Her Registration is "MNAJ"; the Identification number is 45122905, and her account number is 70823. She lives at 1856 Farmington Avenue, West Hartford, Conn. West Hartford's Mill Rate is 46.5. Complete the following tax bill from the given information. Note, if the amount due is greater than $50.00, indicate four (4) equal payments at the bottom of the bill.

Town OF West Hartford
Make Checks payable to:
Tax Collector - West Hartford

19 **LIST** **MOTOR VEHICLE**

When making payment at office ....
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail ....
SEND IN PROPER STUB.
If receipt is desired by mail ....
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

REG NO	YR MAKE	CODE	IDENTIFICATION NO	ACCOUNT NO	TOTAL TAX DUE

OWNER

ALL OWNERS OF MOTOR VEHICLES WHOSE CONN. REGISTRATIONS WERE NOT CANCELLED PRIOR TO JULY 1, 1965 ARE LIABLE FOR THIS TAX. AUTO TAXES CANNOT BE PRORATED FOR A PORTION OF THE YEAR

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

3. Real property is defined as lands and buildings thereon (garages, etc.). The mill rate and the amount of tax is determined by the individual towns. In the past, some towns have levied high mill rates on low assessment values or low mill rates on high assessment values. For example, Hartford's mill rate is 52.4 mills in 1967. Suppose a person's real property is valued at $20,500. To obtain the tax, this individual would pay tax on 65% of $20,500, or $13,325 at 52.4 mills. The tax due is $698.23 ($13,325 times .0524).

The following is Mr. Abee's real property card at the

REAL ESTATE

NAME Mr. Abee 156 Adams Street, Hartford

L 6456

CODE

F3 G RL	**1. Dwellings** **2. Other Buildings**	**3. Lots** **4. Business Buildings**	**5. Mills or Factories** **6. Acres**

ITEM	**LOCATION**	**BUILDINGS**	**O.BUILDINGS**	**LAND**	**TOTAL**
1	156-158 Adams Street	15,630	1,330	1,550	18,510
	M 48				
	8/17/6 Sold @ $22,750				

Compute Mr. Abee's tax based on the property value shown on hi real property card at Municipal Building and complete his tax bill provided below: $18,510 at 52.4 mills

---

CITY OF HARTFORD **TAX BILL** **196** LIST REAL PROPERTY

Make Checks Payable To JOHN D. CURTIN, TAX COLLECTOR Mail To 550 Main St., Hartford, Conn. 06103

When making payment at office . . . . . . PRESENT COMPLETE BILL AND STUBS
When making payment by mail . . . . . . SEND IN PROPER STUB.
If receipt is desired by mail . . . . INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION

ACCOUNT NO L 6456

TOTAL TAX DUE

NAME

Matters pertaining to assessment should be taken up with the Assessor.

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

---

4. Cooley & Snider Realtors Inc. own two (2) 6 family dwellings located at 58-60 and 62-64 Goodwin Street, Hartford. The apartment located at 58-60 Goodwin Street is valued at $28,300. The apartment located at 62-64 Goodwin Street is valued at $32,500. Both lots (grounds) are valued at $2500. Compute the tax due on this real property and complete the following tax form. Use 52.4 mills, 1967 tax rate for Hartford.

CITY OF HARTFORD **TAX BILL** **196** LIST REAL PROPERTY

Make Checks Payable To JOHN D. CURTIN, TAX COLLECTOR Mail To 550 Main St., Hartford, Conn. 06103

When making payment at office . . . . . . PRESENT COMPLETE BILL AND STUBS.
When making payment by mail . . . . . . SEND IN PROPER STUB.
If receipt is desired by mail . . . . INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION
58-60 Goodwin Street
62-64 Goodwin Street

ACCOUNT NO CT 4568

TOTAL TAX DUE

OWNER
Cooley & Snider Realtors
756 Farmington Avenue
Hartford, Conn.

Matters pertaining to assessment should be taken up with the Assessor.

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

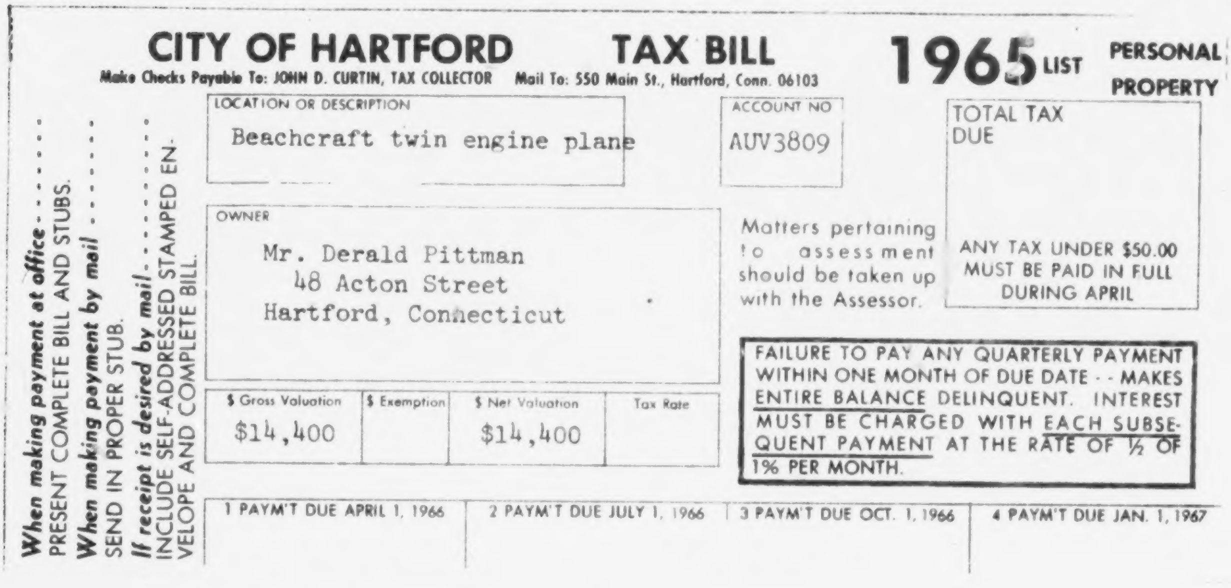
$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

Personal property is taxed in the same manner as real property and motor vehicles. Personal property may be classified as those possessions not belonging to the former two classifications; i.e., motor vehicle and real property. Moreover, in commercial and private businesses, personal property is defined as those tangible items contained in the building for sale (merchandise) or for the production of other goods (machinery). Other items which may also be listed as personal property are boats, planes, etc. Below are some problems in personal property.

11-9 EXERCISE D

1. Mr. Pitman owns a small twin engine plane valued at $14,400. Compute the tax due in 19__, if the mill rate in Windsor is 38 mills.



CITY OF HARTFORD **TAX BILL** **1965** LIST **PERSONAL PROPERTY**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office PRESENT COMPLETE BILL AND STUBS.
When making payment by mail SEND IN PROPER STUB.
If receipt is desired by mail INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION: Beachcraft twin engine plane

ACCOUNT NO: AUV3809

TOTAL TAX DUE:

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

OWNER:
Mr. Derald Pittman
48 Acton Street
Hartford, Connecticut

Matters pertaining to assessment should be taken up with the Assessor.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate
$14,400		$14,400	

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

2. Mr. and Mrs. Kaufman are the proprietors of several small leather goods stores. The shop located in (a) Hartford has stock valued at $22,500, and the shop located in (b) West Hartford has its contents valued at $19,750. Compute the total tax they will pay. Fill out the form and address the forms to the proper towns involved. Use tax rates on p 425.

A

196 LIST **PERSONAL PROPERTY**

When making payment at office.......
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail.......
SEND IN PROPER STUB.
If receipt is desired by mail..........
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION

ACCOUNT NO 78513

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

OWNER
Mr. and Mrs. Allen Kaufman
568 Greenacre Road
Simsbury, Connecticut

Matters pertaining to assessment should be taken up with the Assessor.

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate
$22,500		$22,500	

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

B

196 LIST **PERSONAL PROPERTY**

When making payment at office.......
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail.......
SEND IN PROPER STUB.
If receipt is desired by mail..........
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION

ACCOUNT NO 90156

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

OWNER
Mr. and Mrs. Allen Kaufman
568 Greenacre Road
Simsbury, Connecticut

Matters pertaining to assessment should be taken up with the Assessor.

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate
$19,750		$19,750	

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

11-10 Social Security

When you get your first job, your employer will ask you to get a social security card. You can obtain your social security card from the social security office at the Federal Building at 450 Main Street in Hartford. This card with your social security number belongs to you and only you during all of your working years and thereafter. You will keep this card with your number when you change jobs, move from one city to another, or from one state to another, anywhere in the United States. If you lose your social security card, you can obtain a replacement with the same number from the social security office.

While you are working, you will contribute a part of your pay to the social security fund. During 1966-1967 your employer will keep 4.4% of your earnings, (3.9% for old age, survivors and disability benefits, and 0.5% for hospital insurance benefits), and he will contribute an equal amount which he sends to the social security office of the U.S. Dept. of Health, Education and Welfare. Here is the contribution rate table for employees and employers:

CONTRIBUTION RATE SCHEDULE FOR EMPLOYEES AND EMPLOYERS (EACH)

	Percent of Covered Earnings		
Years	For Retirement, Survivors, and Disability Insurance	For Hospital Insurance	TOTAL
1966	3.85	.35	4.20
1967-68	3.90	.50	4.40
1969-72	4.40	.50	4.90
1973-75	4.85	.55	5.40
1976-79	4.85	.60	5.45
1980-86	4.85	.70	5.55
1987 and after	4.85	.80	5.65

CONTRIBUTION RATE SCHEDULE FOR SELF-EMPLOYED PEOPLE

	Percent of Covered Earnings		
Years	For Retirement, Survivors, and Disability Insurance	For Hospital Insurance	TOTAL
1966	5.80	.35	6.15
1967-68	5.90	.50	6.40
1969-72	6.60	.50	7.10
1973-75	7.00	.55	7.55
1976-79	7.00	.60	7.60
1980-86	7.00	.70	7.70
1987 and after	7.00	.80	7.80

The following charts show the tax withheld from your earnings.

SOCIAL SECURITY EMPLOYEE TAX TABLE—Continued

4.4 percent employee tax deductions (3.9% for old age, survivors, and disability insurance plus %
for hospital insurance benefits)

Wages		Tax to be withheld	Wages		Tax to be withheld	Wages		Tax to be withheld	Wages		Tax to be withheld
At least	But less than		At least	But less than		At least	But less than		At least	But less than	
$58.98	$59.21	$2.60	$73.75	$73.98	$3.25	$88.53	$88.75	$3.90	$103.30	$103.53	$4.55
59.21	59.44	2.61	73.98	74.21	3.26	88.75	88.98	3.91	103.53	103.75	4.56
59.44	59.66	2.62	74.21	74.44	3.27	88.98	89.21	3.92	103.75	103.98	4.57
59.66	59.89	2.63	74.44	74.66	3.28	89.21	89.44	3.93	103.98	104.21	4.58
59.89	60.12	2.64	74.66	74.89	3.29	89.44	89.66	3.94	104.21	104.44	4.59
60.12	60.35	2.65	74.89	75.12	3.30	89.66	89.89	3.95	104.44	104.66	4.60
60.35	60.57	2.66	75.12	75.35	3.31	89.89	90.12	3.96	104.66	104.89	4.61
60.57	60.80	2.67	75.35	75.57	3.32	90.12	90.35	3.97	104.89	105.12	4.62
60.80	61.03	2.68	75.57	75.80	3.33	90.35	90.57	3.98	105.12	105.35	4.63
61.03	61.25	2.69	75.80	76.03	3.34	90.57	90.80	3.99	105.35	105.57	4.64
61.25	61.48	2.70	76.03	76.25	3.35	90.80	91.03	4.00	105.57	105.80	4.65
61.48	61.71	2.71	76.25	76.48	3.36	91.03	91.25	4.01	105.80	106.03	4.66
61.71	61.94	2.72	76.48	76.71	3.37	91.25	91.48	4.02	106.03	106.25	4.67
61.94	62.16	2.73	76.71	76.94	3.38	91.48	91.71	4.03	106.25	106.48	4.68
62.16	62.39	2.74	76.94	77.16	3.39	91.71	91.94	4.04	106.48	106.71	4.69
62.39	62.62	2.75	77.16	77.39	3.40	91.94	92.16	4.05	106.71	106.94	4.70
62.62	62.85	2.76	77.39	77.62	3.41	92.16	92.39	4.06	106.94	107.16	4.71
62.85	63.07	2.77	77.62	77.85	3.42	92.39	92.62	4.07	107.16	107.39	4.72
63.07	63.30	2.78	77.85	78.07	3.43	92.62	92.85	4.08	107.39	107.62	4.73
63.30	63.53	2.79	78.07	78.30	3.44	92.85	93.07	4.09	107.62	107.85	4.74
63.53	63.75	2.80	78.30	78.53	3.45	93.07	93.30	4.10	107.85	108.07	4.75
63.75	63.98	2.81	78.53	78.75	3.46	93.30	93.53	4.11	108.07	108.30	4.76
63.98	64.21	2.82	78.75	78.98	3.47	93.53	93.75	4.12	108.30	108.53	4.77
64.21	64.44	2.83	78.98	79.21	3.48	93.75	93.98	4.13	108.53	108.75	4.78
64.44	64.66	2.84	79.21	79.44	3.49	93.98	94.21	4.14	108.75	108.98	4.79
64.66	64.89	2.85	79.44	79.66	3.50	94.21	94.44	4.15	108.98	109.21	4.80
64.89	65.12	2.86	79.66	79.89	3.51	94.44	94.66	4.16	109.21	109.44	4.81
65.12	65.35	2.87	79.89	80.12	3.52	94.66	94.89	4.17	109.44	109.66	4.82
65.35	65.57	2.88	80.12	80.35	3.53	94.89	95.12	4.18	109.66	109.89	4.83
65.57	65.80	2.89	80.35	80.57	3.54	95.12	95.35	4.19	109.89	110.12	4.84
65.80	66.03	2.90	80.57	80.80	3.55	95.35	95.57	4.20	110.12	110.35	4.85
66.03	66.25	2.91	80.80	81.03	3.56	95.57	95.80	4.21	110.35	110.57	4.86
66.25	66.48	2.92	81.03	81.25	3.57	95.80	96.03	4.22	110.57	110.80	4.87
66.48	66.71	2.93	81.25	81.48	3.58	96.03	96.25	4.23	110.80	111.03	4.88
66.71	66.94	2.94	81.48	81.71	3.59	96.25	96.48	4.24	111.03	111.25	4.89
66.94	67.16	2.95	81.71	81.94	3.60	96.48	96.71	4.25	111.25	111.48	4.90
67.16	67.39	2.96	81.94	82.16	3.61	96.71	96.94	4.26	111.48	111.71	4.91
67.39	67.62	2.97	82.16	82.39	3.62	96.94	97.16	4.27	111.71	111.94	4.92
67.62	67.85	2.98	82.39	82.62	3.63	97.16	97.39	4.28	111.94	112.16	4.93
67.85	68.07	2.99	82.62	82.85	3.64	97.39	97.62	4.29	112.16	112.39	4.94
68.07	68.30	3.00	82.85	83.07	3.65	97.62	97.85	4.30	112.39	112.62	4.95
68.30	68.53	3.01	83.07	83.30	3.66	97.85	98.07	4.31	112.62	112.85	4.96
68.53	68.75	3.02	83.30	83.53	3.67	98.07	98.30	4.32	112.85	113.07	4.97
68.75	68.98	3.03	83.53	83.75	3.68	98.30	98.53	4.33	113.07	113.30	4.98
68.98	69.21	3.04	83.75	83.98	3.69	98.53	98.75	4.34	113.30	113.53	4.99
69.21	69.44	3.05	83.98	84.21	3.70	98.75	98.98	4.35	113.53	113.75	5.00
69.44	69.66	3.06	84.21	84.44	3.71	98.98	99.21	4.36	113.75	113.98	5.01
69.66	69.89	3.07	84.44	84.66	3.72	99.21	99.44	4.37	113.98	114.21	5.02
69.89	70.12	3.08	84.66	84.89	3.73	99.44	99.66	4.38	114.21	114.44	5.03
70.12	70.35	3.09	84.89	85.12	3.74	99.66	99.89	4.39	114.44	114.66	5.04
70.35	70.57	3.10	85.12	85.35	3.75	99.89	100.12	4.40	114.66	114.89	5.05
70.57	70.80	3.11	85.35	85.57	3.76	100.12	100.35	4.41	114.89	115.12	5.06
70.80	71.03	3.12	85.57	85.80	3.77	100.35	100.57	4.42	115.12	115.35	5.07
71.03	71.25	3.13	85.80	86.03	3.78	100.57	100.80	4.43	115.35	115.57	5.08
71.25	71.48	3.14	86.03	86.25	3.79	100.80	101.03	4.44	115.57	115.80	5.09
71.48	71.71	3.15	86.25	86.48	3.80	101.03	101.25	4.45	115.80	116.03	5.10
71.71	71.94	3.16	86.48	86.71	3.81	101.25	101.48	4.46	116.03	116.25	5.11
71.94	72.16	3.17	86.71	86.94	3.82	101.48	101.71	4.47	116.25	116.48	5.12
72.16	72.39	3.18	86.94	87.16	3.83	101.71	101.94	4.48	116.48	116.71	5.13
72.39	72.62	3.19	87.16	87.39	3.84	101.94	102.16	4.49	116.71	116.94	5.14
72.62	72.85	3.20	87.39	87.62	3.85	102.16	102.39	4.50	116.94	117.16	5.15
72.85	73.07	3.21	87.62	87.85	3.86	102.39	102.62	4.51	117.16	117.39	5.16
73.07	73.30	3.22	87.85	88.07	3.87	102.62	102.85	4.52	117.39	117.62	5.17
73.30	73.53	3.23	88.07	88.30	3.88	102.85	103.07	4.53	117.62	117.85	5.18
73.53	73.75	3.24	88.30	88.53	3.89	103.07	103.30	4.54	117.85	118.07	5.19

SOCIAL SECURITY EMPLOYEE TAX TABLE—Continued

4.4 percent employee tax deductions (3.9% for old age, survivors, and disability insurance plus 0. for hospital insurance benefits)

Wages		Tax to be withheld	Wages		Tax to be withheld	Wages		Tax to be withheld	Wages		Tax to be withheld
At least	But less than		At least	But less than		At least	But less than		At least	But less than	
$118.07	$118.30	$5.20	$132.85	$133.07	$5.85	$147.62	$147.85	$6.50	$162.39	$162.62	$7.15
118.30	118.53	5.21	133.07	133.30	5.86	147.85	148.07	6.51	162.62	162.85	7.16
118.53	118.75	5.22	133.30	133.53	5.87	148.07	148.30	6.52	162.85	163.07	7.17
118.75	118.98	5.23	133.53	133.75	5.88	148.30	148.53	6.53	163.07	163.30	7.18
118.98	119.21	5.24	133.75	133.98	5.89	148.53	148.75	6.54	163.30	163.53	7.19
119.21	119.44	5.25	133.98	134.21	5.90	148.75	148.98	6.55	163.53	163.75	7.20
119.44	119.66	5.26	134.21	134.44	5.91	148.98	149.21	6.56	163.75	163.98	7.21
119.66	119.89	5.27	134.44	134.66	5.92	149.21	149.44	6.57	163.98	164.21	7.22
119.89	120.12	5.28	134.66	134.89	5.93	149.44	149.66	6.58	164.21	164.44	7.23
120.12	120.35	5.29	134.89	135.12	5.94	149.66	149.89	6.59	164.44	164.66	7.24
120.35	120.57	5.30	135.12	135.35	5.95	149.89	150.12	6.60	164.66	164.89	7.25
120.57	120.80	5.31	135.35	135.57	5.96	150.12	150.35	6.61	164.89	165.12	7.26
120.80	121.03	5.32	135.57	135.80	5.97	150.35	150.57	6.62	165.12	165.35	7.27
121.03	121.25	5.33	135.80	136.03	5.98	150.57	150.80	6.63	165.35	165.57	7.28
121.25	121.48	5.34	136.03	136.25	5.99	150.80	151.03	6.64	165.57	165.80	7.29
121.48	121.71	5.35	136.25	136.48	6.00	151.03	151.25	6.65	165.80	166.03	7.30
121.71	121.94	5.36	136.48	136.71	6.01	151.25	151.48	6.66	166.03	166.25	7.31
121.94	122.16	5.37	136.71	136.94	6.02	151.48	151.71	6.67	166.25	166.48	7.32
122.16	122.39	5.38	136.94	137.16	6.03	151.71	151.94	6.68	166.48	166.71	7.33
122.39	122.62	5.39	137.16	137.39	6.04	151.94	152.16	6.69	166.71	166.94	7.34
122.62	122.85	5.40	137.39	137.62	6.05	152.16	152.39	6.70	166.94	167.16	7.35
122.85	123.07	5.41	137.62	137.85	6.06	152.39	152.62	6.71	167.16	167.39	7.36
123.07	123.30	5.42	137.85	138.07	6.07	152.62	152.85	6.72	167.39	167.62	7.37
123.30	123.53	5.43	138.07	138.30	6.08	152.85	153.07	6.73	167.62	167.85	7.38
123.53	123.75	5.44	138.30	138.53	6.09	153.07	153.30	6.74	167.85	168.07	7.39
123.75	123.98	5.45	138.53	138.75	6.10	153.30	153.53	6.75	168.07	168.30	7.40
123.98	124.21	5.46	138.75	138.98	6.11	153.53	153.75	6.76	168.30	168.53	7.41
124.21	124.44	5.47	138.98	139.21	6.12	153.75	153.98	6.77	168.53	168.75	7.42
124.44	124.66	5.48	139.21	139.44	6.13	153.98	154.21	6.78	168.75	168.98	7.43
124.66	124.89	5.49	139.44	139.66	6.14	154.21	154.44	6.79	168.98	169.21	7.44
124.89	125.12	5.50	139.66	139.89	6.15	154.44	154.66	6.80	169.21	169.44	7.45
125.12	125.35	5.51	139.89	140.12	6.16	154.66	154.89	6.81	169.44	169.66	7.46
125.35	125.57	5.52	140.12	140.35	6.17	154.89	155.12	6.82	169.66	169.89	7.47
125.57	125.80	5.53	140.35	140.57	6.18	155.12	155.35	6.83	169.89	170.12	7.48
125.80	126.03	5.54	140.57	140.80	6.19	155.35	155.57	6.84	170.12	170.35	7.49
126.03	126.25	5.55	140.80	141.03	6.20	155.57	155.80	6.85	170.35	170.57	7.50
126.25	126.48	5.56	141.03	141.25	6.21	155.80	156.03	6.86	170.57	170.80	7.51
126.48	126.71	5.57	141.25	141.48	6.22	156.03	156.25	6.87	170.80	171.03	7.52
126.71	126.94	5.58	141.48	141.71	6.23	156.25	156.48	6.88	171.03	171.25	7.53
126.94	127.16	5.59	141.71	141.94	6.24	156.48	156.71	6.89	171.25	171.48	7.54
127.16	127.39	5.60	141.94	142.16	6.25	156.71	156.94	6.90	171.48	171.71	7.55
127.39	127.62	5.61	142.16	142.39	6.26	156.94	157.16	6.91	171.71	171.94	7.56
127.62	127.85	5.62	142.39	142.62	6.27	157.16	157.39	6.92	171.94	172.16	7.57
127.85	128.07	5.63	142.62	142.85	6.28	157.39	157.62	6.93	172.16	172.39	7.58
128.07	128.30	5.64	142.85	143.07	6.29	157.62	157.85	6.94	172.39	172.62	7.59
128.30	128.53	5.65	143.07	143.30	6.30	157.85	158.07	6.95	172.62	172.85	7.60
128.53	128.75	5.66	143.30	143.53	6.31	158.07	158.30	6.96	172.85	173.07	7.61
128.75	128.98	5.67	143.53	143.75	6.32	158.30	158.53	6.97	173.07	173.30	7.62
128.98	129.21	5.68	143.75	143.98	6.33	158.53	158.75	6.98	173.30	173.53	7.63
129.21	129.44	5.69	143.98	144.21	6.34	158.75	158.98	6.99	173.53	173.75	7.64
129.44	129.66	5.70	144.21	144.44	6.35	158.98	159.21	7.00	173.75	173.98	7.65
129.66	129.89	5.71	144.44	144.66	6.36	159.21	159.44	7.01	173.98	174.21	7.66
129.89	130.12	5.72	144.66	144.89	6.37	159.44	159.66	7.02	174.21	174.44	7.67
130.12	130.35	5.73	144.89	145.12	6.38	159.66	159.89	7.03	174.44	174.66	7.68
130.35	130.57	5.74	145.12	145.35	6.39	159.89	160.12	7.04	174.66	174.89	7.69
130.57	130.80	5.75	145.35	145.57	6.40	160.12	160.35	7.05	174.89	175.12	7.70
130.80	131.03	5.76	145.57	145.80	6.41	160.35	160.57	7.06	175.12	175.35	7.71
131.03	131.25	5.77	145.80	146.03	6.42	160.57	160.80	7.07	175.35	175.57	7.72
131.25	131.48	5.78	146.03	146.25	6.43	160.80	161.03	7.08	175.57	175.80	7.73
131.48	131.71	5.79	146.25	146.48	6.44	161.03	161.25	7.09	175.80	176.03	7.74
131.71	131.94	5.80	146.48	146.71	6.45	161.25	161.48	7.10	176.03	176.25	7.75
131.94	132.16	5.81	146.71	146.94	6.46	161.48	161.71	7.11	176.25	176.48	7.76
132.16	132.39	5.82	146.94	147.16	6.47	161.71	161.94	7.12	176.48	176.71	7.77
132.39	132.62	5.83	147.16	147.39	6.48	161.94	162.16	7.13	176.71	176.94	7.78
132.62	132.85	5.84	147.39	147.62	6.49	162.16	162.39	7.14	176.94	177.16	7.79

When your earnings stop or are reduced because you become disabled, or when you retire, monthly benefits are paid from the social security funds to replace part of your earnings lost. The following chart shows the monthly cash benefits payments dependent upon your earnings and conditions of unemployment.

EXAMPLES OF MONTHLY CASH BENEFIT PAYMENTS [1]

Average yearly earnings after 1950 →	$800 or less	$1800	$3000	$3600	$4200	$4800	$5400	$6600
Retirement at 65/ Disability benefits	$ 44.00	$ 78.20	$101.70	$112.40	$124.20	$135.90	$146.00	$168.00
Retirement at 64	41.10	73.00	95.00	105.00	116.00	126.90	136.30	156.80
Retirement at 63	38.20	67.80	88.20	97.50	107.70	117.80	126.60	145.60
Retirement at 62	35.20	62.60	81.40	90.00	99.40	108.80	116.80	134.40
Wife's benefit at 65 or with child in her care	22.00	39.10	50.90	56.20	62.10	68.00	73.00	84.00
Wife's benefit at 64	20.20	35.90	46.70	51.60	57.00	62.40	67.00	77.00
Wife's benefit at 63	18.40	32.60	42.50	46.90	51.80	56.70	60.90	70.00
Wife's benefit at 62	16.50	29.40	38.20	42.20	46.60	51.00	54.80	63.00
One child of retired or disabled worker	22.00	39.10	50.90	56.20	62.10	68.00	73.00	84.00
Widow 62 or over	44.00	64.50	84.00	92.80	102.50	112.20	120.50	138.60
Widow at 60, no child	38.20	56.00	72.80	80.50	88.90	97.30	104.50	120.20
Widow under 62 and 1 child	66.00	117.40	152.60	168.60	186.40	204.00	219.00	252.00
Widow under 62 and 2 children	66.00	120.00	202.40	240.00	279.60	306.00	328.00	368.00
One surviving child	44.00	58.70	76.30	84.30	93.20	102.00	109.50	126.00
Two surviving children	66.00	117.40	152.60	168.60	186.40	204.00	219.00	252.00
Maximum family payment	66.00	120.00	202.40	240.00	280.80	309.20	328.00	368.00

[1] Generally, in figuring average yearly earnings after 1950, 5 years of low earnings or no earnings can be excluded. The maximum earnings creditable for social security are $3600 for 1951-54; $4200 for 1955-58; $4800 for 1959-1965; and $6600 starting in 1966. Because of this, the benefits shown in the last two columns on the right will not generally be payable for some years to come.

Notice that you pay social security contributions up to $6600 of your earnings. You do not pay social security contributions for earnings over $6600. Part of your contributions go into a hospital insurance fund, so that when you reach 65 years of age, you will receive help toward paying hospital bills.

11-10 EXERCISES A:

1. If you earned $1823 last year on a part time job, how much S.S. tax was held from your wages? (4.4% of $1823.) How much did your employer contribute toward your account?

2. If your father earned $5,820 last year, how much did his employer withhold for S.S. tax? What was the total amount contributed toward his credit for S.S. during last year?

3. Using the Social Security Employee Tax Table, find the amount of tax withheld for the following weekly earnings:

Weekly Earnings	Tax Withheld Per Week	Tax Withheld for the Year
a) $60.00	____________	____________
b) $72.00	____________	____________
c) $81.40	____________	____________
d) $86.75	____________	____________
e) $93.15	____________	____________
f) $96.70	____________	____________

4. Mr. Cox earned $600 per month. How much social security did he have for one year? (Maximum earning creditable for S.S. in 1966 is $6600 per year.)

5. Mr. Burns owns his own bakery, so he contributes S.S. on the basis of self-employed persons. How much S.S. will he contribute, if he earns $6284 during 1966?

6. If Bill Carlson's average earnings since 1950 were $4800, how much will he receive each month during his retirement beginning at age 65?

7. Mr. Crane plans to retire at 62. His average yearly earnings since 1950 have been $5400. How much will he receive per month during his retirement. How much will he receive each year?

8. Mr. Boyd died at age 48 and left a wife and two children under 18 years of age. How much will Mrs. Boyd receive each month is Mr. Boyd's average earnings since 1950 were $4200. How much will she receive per year?

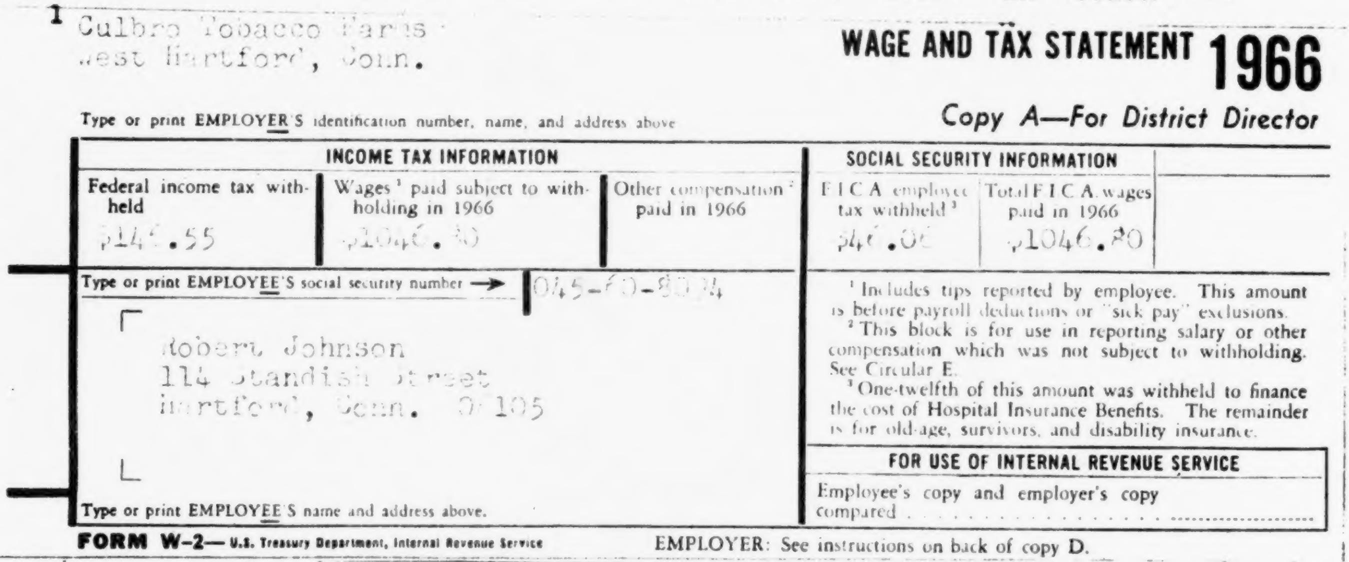
9. Mr. Jackson, age 66 and Mrs. Jackson, age 62 are retired. Mr. Jackson earned an average of $6600 per year since 1950. How much will they receive per year from social security?

10. Mrs. Reid is a widow with 5 children. Her husband's average yearly earnings since 1950 was $7500. How much social security benefit will she receive per month? What is her annual income?

11-11 Income Taxes

When you have a job, your employer will issue you a wage and tax statement each January showing your name, address and social security number, wages you have been paid subject to withholding tax, amount of Federal Income tax withheld, and the amount of social security (FICA) tax withheld from your pay check during the year.

Here is a copy of a wage and tax statement known as a Form W-2, and also a 1040 A U.S. Invididual Income Tax Return Card



1 Culbro Tobacco Farms
West Hartford, Conn.

WAGE AND TAX STATEMENT 1966

Type or print EMPLOYER'S identification number, name, and address above

Copy A—For District Director

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F I C A employee tax withheld[3]	Total F I C A wages paid in 1966
$146.55	$1046.80		$46.06	$1046.80

Type or print EMPLOYEE'S social security number → 045-60-8004

Robert Johnson
114 Standish Street
Hartford, Conn. 06105

Type or print EMPLOYEE'S name and address above.

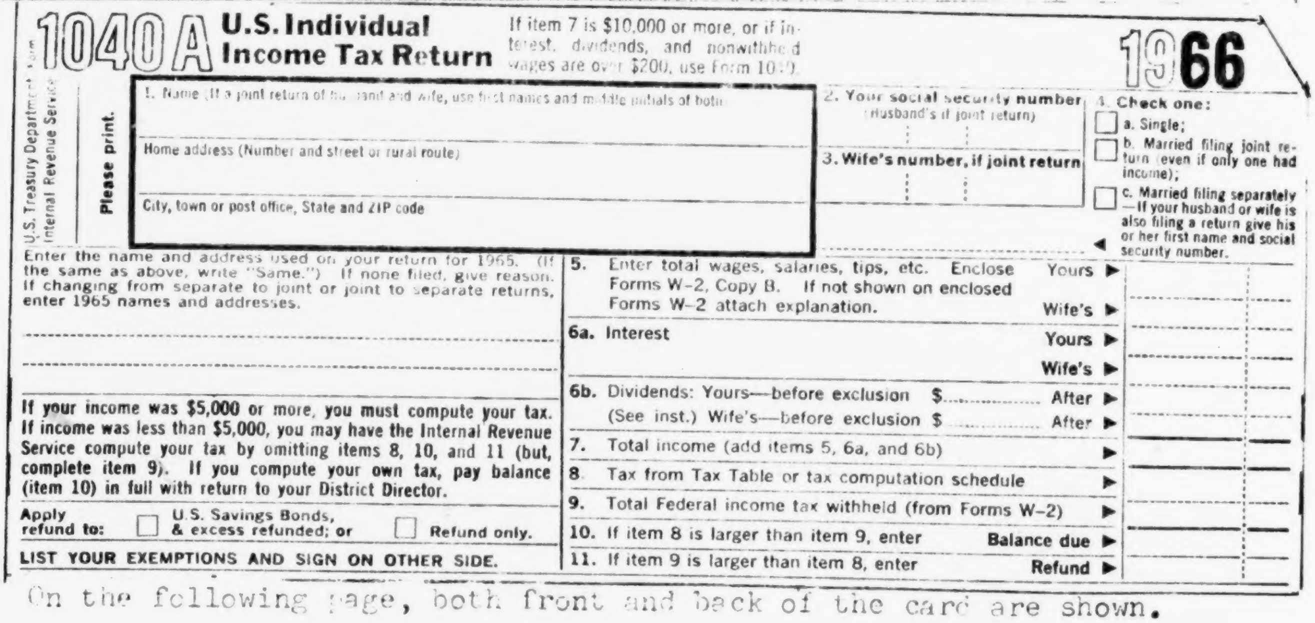
[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.
[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.
[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared ....

FORM W-2— U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.



U.S. Treasury Department Internal Revenue Service Form **1040 A U.S. Individual Income Tax Return** **1966**

If item 7 is $10,000 or more, or if interest, dividends, and nonwithheld wages are over $200, use Form 1040.

Please print.

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
- ☐ a. Single;
- ☐ b. Married filing joint return (even if only one had income);
- ☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◄

Enter the name and address used on your return for 1965. (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1965 names and addresses.

If your income was $5,000 or more, you must compute your tax. If income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11 (but, complete item 9). If you compute your own tax, pay balance (item 10) in full with return to your District Director.

Apply refund to: ☐ U.S. Savings Bonds, & excess refunded; or ☐ Refund only.

LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE.

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation. Yours ► Wife's ►

6a. Interest Yours ► Wife's ►

6b. Dividends: Yours—before exclusion $.............. After ►
(See inst.) Wife's—before exclusion $.............. After ►

7. Total income (add items 5, 6a, and 6b) ►

8. Tax from Tax Table or tax computation schedule ►

9. Total Federal income tax withheld (from Forms W-2) ►

10. If item 8 is larger than item 9, enter Balance due ►

11. If item 9 is larger than item 8, enter Refund ►

On the following page, both front and back of the card are shown.

Form 1040 A U.S. Individual Income Tax Return (Less than $10,000 total income) 1966

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both) ROBERT JOHNSON

Home address (Number and street or rural route) 114 STANDISH STREET

City, town or post office, State and Postal ZIP code HARTFORD, CONN. 06105

2. Your social security number (Husband's if joint return) 045 60 8094

3. Wife's number, if joint return

4. Check one:

☑ a. Single;

☐ b. Married filing joint return (even if only one had income);

☐ c. Married filing separately – If your husband or wife is also filing a return give his or her first name and social security number. ◄

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses.

5. Enter total wages, salaries, tips, etc. Enclose Forms W 2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	$ 1046	80
	Wife's ▶		
6. Interest and dividends	Yours ▶		
	Wife's ▶		
7. Total income (add items 5 and 6)	▶	$ 1046	80
8. Tax from Tax Table or tax computation schedule	▶	$ 19	00
9. Total Federal income tax withheld (from Forms W-2)	▶	146	55
10. If item 8 is larger than item 9, enter	balance due ▶		
11. If item 9 is larger than item 8, enter	refund ▶	127	55

Apply refund to: ☐ U.S. Savings Bonds, & excess refunded; or ☑ Refund only.

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE.

260946A

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	~~65 or over~~	Blind
Yourself	☑	☐	☐
Wife	☐	☐	☐

Enter number of exemptions checked ▶▶▶ 1

13. First names of your dependent children who lived with you

Enter number ▶ 0

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶ 0

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE ▶ 1

Your present employer CULBRO TOBACCO FARMS

Wife's present employer

City and State where employed WEST HARTFORD, CONN

City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

Robert Johnson

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income.

MMG.

Date April 1, 1967

260968A

1

WAGE AND TAX STATEMENT 1966

Type or print EMPLOYER'S identification number, name, and address above.

Copy A—For District Director

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966
$ 146.55	$ 1046.80		$46.06	$1046.80

Type or print EMPLOYEE'S social security number → 045-60-8094

ROBERT JOHNSON
114 STANDISH STREET
HARTFORD, CONN. 06105

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared

FORM W-2— U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

Every citizen or resident of the United States under 65 who had $600 or more income during the year must file a tax return.

If your income was less than $10,000 and not more than $200 total of dividends, interest and other wages and tips, you may use the card form.

You can file your return after January 1, but not later than April 15 of any year.

Let's complete the 1040A income tax return using the information given on form W-2 on the withholding tax statement.

①. Be sure to enter the first name and middle initial and last name; home address, city, state, and zip code in the block provided.

② Enter the social security number. Check so that the S.S. number agrees with the number on the social security card and form W-2.

③ Show wife's social security number if married.

④ Check whether single, married (joint return), or married (filed separately)

⑤ Enter total wages from all forms W-2 if you are working at more than one job. (Robert Johnson's total wages were $1046.80.)

⑥ List interest and dividend. (If there is no interest or dividends, leave space blank.)

⑦ Total income. (Add total wages and interest and dividends.)

⑧. If your income was less than $5000, use the Tax Table, on page . If your income was more than $5000 but less than $10,000 use the Tax Schedule on page . (Since Robert Johnson earned $1046.80, this is more than $1025 but less than $1050, so his tax is $19.00 on Tax Table, page .)

⑨. Income tax withheld as shown on form W-2. (Robert Johnson's $146.55)

⑩ ⑪. Since income tax withheld is larger than tax due from tax table, (146.55 - $19.00 = $127.55), Robert Johnson will enter $127.55 on line 11.

Remember to check the space to indicate whether you want overpayment in U.S. Savings Bonds or a check for the refund.

⑫. Check space below regular ☑ for single person and enter number "1" for exemptions checked.

⑬. List dependends who receive more than one-half their support from you.

⑮. Total exemptions.

Fill in the space in the lower left corner of 1040A with the name and address of your employer.

(Robert Johnson's employer is Culbro Tobacco Farms, West Hartford, Conn.)

The income tax return must always have the signature of the person submitting it. Since Robert Johnson is not available to sign it, you have my permission to sign his name on his form, with your initials below his name. It is really not legal to sign another person's name. This is considered forgery.

Since the following problems are practice exercises, you may sign the name of the person used, with your initials below the signature.

Be sure to date your return.

11-11 EXERCISES A: Complete the withholding tax statements for the following wages: Use 14% of the income to determine Federal income tax withheld and 4.4% of wages less than $6600 for Social Security (FICA employees tax). Use your name and social security number. Round off taxes to the nearest cent. Then complete 1040A short form income tax return using the information on the form W-2 and tax tables, page 444 .

	Wages	Exemptions
1.	$1150.00	1
2.	$1826.00	1
3.	$2391.00	1
4.	$3513.00	2
5.	$4140.00	3
6.	$4735.00	4

TAX TABLES FOR INCOMES UNDER $5,000

If your total income (item 7 of your return) is $5,000 or more, use Tax Computation Schedule on page 4

If you checked as your filing status on page 1, Form 1040A..........
- Item 4a. Single, use → Tax Table A
- Item 4b. Married Filing Joint Return, use → Tax Table B
- Item 4c. Married Filing Separately, use → Tax Table C

Tables A and B reflect the lowest tax after considering both the 10 percent standard deduction and the minimum standard deduction. Table C shows the tax based on either the 10 percent or the minimum standard deduction.

1966 TAX TABLE A—FOR SINGLE PERSONS

To find your tax read down income columns until you find the line covering the total income shown as item 7. Then read across to the appropriate column headed by the number corresponding to the number of exemptions claimed on item 15. Enter tax in item 8.

If your total income is—		And the number of exemptions is—		
At least	But less than	1	2	3 (If 4 or more there is no tax)
		Your tax is—		
$0	$900	$0	$0	$0
900	925	2	0	0
925	950	5	0	0
950	975	9	0	0
975	1,000	12	0	0
1,000	1,025	16	0	0
1,025	1,050	19	0	0
1,050	1,075	23	0	0
1,075	1,100	26	0	0
1,100	1,125	30	0	0
1,125	1,150	33	0	0
1,150	1,175	37	0	0
1,175	1,200	40	0	0
1,200	1,225	44	0	0
1,225	1,250	47	0	0
1,250	1,275	51	0	0
1,275	1,300	54	0	0
1,300	1,325	58	0	0
1,325	1,350	61	0	0
1,350	1,375	65	0	0
1,375	1,400	68	0	0
1,400	1,425	72	0	0
1,425	1,450	76	0	0
1,450	1,475	79	0	0
1,475	1,500	83	0	0
1,500	1,525	87	0	0
1,525	1,550	91	0	0
1,550	1,575	94	0	0
1,575	1,600	98	0	0
1,600	1,625	102	2	0
1,625	1,650	106	5	0
1,650	1,675	109	9	0
1,675	1,700	113	12	0
1,700	1,725	117	16	0
1,725	1,750	121	19	0
1,750	1,775	124	23	0
1,775	1,800	128	26	0
1,800	1,825	132	30	0
1,825	1,850	136	33	0
1,850	1,875	139	37	0
1,875	1,900	143	40	0
1,900	1,925	147	44	0
1,925	1,950	151	47	0
1,950	1,975	155	51	0
1,975	2,000	159	54	0
2,000	2,025	163	58	0
2,025	2,050	167	61	0
2,050	2,075	171	65	0
2,075	2,100	175	68	0
2,100	2,125	179	72	0
2,125	2,150	183	76	0
2,150	2,175	187	79	0
2,175	2,200	191	83	0
2,200	2,225	195	87	0
2,225	2,250	199	91	0
2,250	2,275	203	94	0
2,275	2,300	207	98	0
2,300	2,325	211	102	2
2,325	2,350	215	106	5
2,350	2,375	219	109	9
2,375	2,400	223	113	12
2,400	2,425	227	117	16
2,425	2,450	231	121	19

If your total income is—		And the number of exemptions is—					
At least	But less than	1	2	3	4	5	6 (If 7 or more there is no tax)
		Your tax is—					
$2,450	$2,475	$236	$124	$23	$0	$0	$0
2,475	2,500	240	128	26	0	0	0
2,500	2,525	244	132	30	0	0	0
2,525	2,550	248	136	33	0	0	0
2,550	2,575	253	139	37	0	0	0
2,575	2,600	257	143	40	0	0	0
2,600	2,625	261	147	44	0	0	0
2,625	2,650	265	151	47	0	0	0
2,650	2,675	270	155	51	0	0	0
2,675	2,700	274	159	54	0	0	0
2,700	2,725	278	163	58	0	0	0
2,725	2,750	282	167	61	0	0	0
2,750	2,775	287	171	65	0	0	0
2,775	2,800	291	175	68	0	0	0
2,800	2,825	295	179	72	0	0	0
2,825	2,850	299	183	76	0	0	0
2,850	2,875	304	187	79	0	0	0
2,875	2,900	308	191	83	0	0	0
2,900	2,925	312	195	87	0	0	0
2,925	2,950	317	199	91	0	0	0
2,950	2,975	322	203	94	0	0	0
2,975	3,000	327	207	98	0	0	0
3,000	3,050	333	213	104	4	0	0
3,050	3,100	342	221	111	11	0	0
3,100	3,150	350	229	119	18	0	0
3,150	3,200	359	238	126	25	0	0
3,200	3,250	367	246	134	32	0	0
3,250	3,300	376	255	141	39	0	0
3,300	3,350	385	263	149	46	0	0
3,350	3,400	393	272	157	53	0	0
3,400	3,450	402	280	165	60	0	0
3,450	3,500	410	289	173	67	0	0
3,500	3,550	419	297	181	74	0	0
3,550	3,600	427	306	189	81	0	0
3,600	3,650	436	315	197	89	0	0
3,650	3,700	444	324	205	96	0	0
3,700	3,750	453	334	213	104	4	0
3,750	3,800	462	343	221	111	11	0
3,800	3,850	470	353	229	119	18	0
3,850	3,900	479	362	238	126	25	0
3,900	3,950	487	372	246	134	32	0
3,950	4,000	496	381	255	141	39	0
4,000	4,050	504	390	263	149	46	0
4,050	4,100	513	399	272	157	53	0
4,100	4,150	521	407	280	165	60	0
4,150	4,200	530	416	289	173	67	0
4,200	4,250	538	424	297	181	74	0
4,250	4,300	547	433	306	189	81	0
4,300	4,350	556	442	315	197	89	0
4,350	4,400	564	450	324	205	96	0
4,400	4,450	573	459	334	213	104	4
4,450	4,500	581	467	343	221	111	11
4,500	4,550	590	476	353	229	119	18
4,550	4,600	598	484	362	238	126	25
4,600	4,650	607	493	372	246	134	32
4,650	4,700	615	501	381	255	141	39
4,700	4,750	624	510	391	263	149	46
4,750	4,800	633	519	400	272	157	53
4,800	4,850	641	527	410	280	165	60
4,850	4,900	650	536	419	289	173	67
4,900	4,950	658	544	429	297	181	74
4,950	5,000	667	553	438	306	189	81

Form 1040 A U.S. Individual Income Tax Return (Less than $10,000 total income)

196

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:

☐ a. Single;

☐ b. Married filing joint return (even if only one had income);

☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses.

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	**balance due** ▶	
11. If item 9 is larger than item 8, enter	**refund** ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 26094A

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind	
Yourself	☐	☐	☐	**Enter number of exemptions checked** ▶▶▶
Wife	☐	☐	☐	

13. First names of your dependent children who lived with you .... **Enter number** ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer	**Wife's present employer**
City and State where employed	**City and State where employed**

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. **Date**

26096A

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966	

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

445

Form 1040A U.S. Individual Income Tax Return (Less than $10,000 total income)

196

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
- ☐ **a. Single;**
- ☐ **b. Married filing joint return (even if only one had income);**
- ☐ **c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number.** ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses.

....

....

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation	Yours ▶		
	Wife's ▶		
6. Interest and dividends	Yours ▶		
	Wife's ▶		
7. Total income (add items 5 and 6)	▶		
8. Tax from Tax Table or tax computation schedule	▶		
9. Total Federal income tax withheld (from Forms W-2)	▶		
10. If item 8 is larger than item 9, enter	**balance due** ▶		
11. If item 9 is larger than item 8, enter	**refund** ▶		

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 260944

		Regular	65 or over	Blind	
12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →	Yourself	☐	☐	☐	Enter number of exemptions checked ▶▶▶
	Wife	☐	☐	☐	

13. First names of your dependent children who lived with you ....

.... Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer	Wife's present employer
City and State where employed	City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. Date

[illegible]

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966	

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared ....

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

1040A U.S. Individual Income Tax Return (Less than $10,000 total income)

196

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
- ☐ a. Single;
- ☐ b. Married filing joint return (even if only one had income);
- ☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as **above, write** "Same.") If none filed, give reason. If changing from **separate** to joint or joint to separate returns, enter 1964 names and **addresses.**

....

....

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting Items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	**balance due** ▶	
11. If item 9 is larger than item 8, enter	**refund** ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 260944

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind	
Yourself	☐	☐	☐	Enter number of exemptions checked ▶▶▶
Wife	☐	☐	☐	

13. First names of your dependent children who lived with you .... Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer	Wife's present employer
City and State where employed	City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ **if appropriate.**

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income   Date

260984

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966	

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.
[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.
[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared ....

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

Form **1040 A** **U.S. Individual Income Tax Return** (Less than $10,000 total income) **196**

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
- ☐ a. Single;
- ☐ b. Married filing joint return (even if only one had income);
- ☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from **separate** to joint or joint to separate returns, enter 1964 names and **addresses.**

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	**balance due** ▶	
11. If item 9 is larger than item 8, enter	**refund** ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

U.S. TREASURY DEPARTMENT ● INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 26094A

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind	
Yourself	☐	☐	☐	Enter number of exemptions checked ▶▶▶
Wife	☐	☐	☐	

13. First names of your dependent children who lived with you

Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE ▶

Your present employer	Wife's present employer
City and State where employed	City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. Date

26096BA

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared . . . .

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

Form 1040 A U.S. Individual Income Tax Return (Less than $10,000 total income)

196

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
- ☐ a. Single;
- ☐ b. Married filing joint return (even if only one had income);
- ☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◄

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses.

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting Items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	balance due ▶	
11. If item 9 is larger than item 8, enter	refund ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 260944

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind	
Yourself	☐	☐	☐	Enter number of exemptions checked ▶▶▶
Wife	☐	☐	☐	

13. First names of your dependent children who lived with you .... Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer	**Wife's present employer**
City and State where employed	**City and State where employed**

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. Date

260944A

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966	

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared ....

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

449

1040 A U.S. Individual Income Tax Return (Less than $10,000 total income)

196

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. **Your social security number** (Husband's if joint return)

3. **Wife's number, if joint return**

4. **Check one:**

☐ a. Single;

☐ b. Married filing joint return (even if only one had income);

☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (if the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	balance due ▶	
11. If item 9 is larger than item 8, enter	refund ▶	

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE.

760944

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income)
Check boxes which apply →

	Regular	65 or over	Blind	
Yourself	☐	☐	☐	Enter number of exemptions checked ▶▶▶
Wife	☐	☐	☐	

13. First names of your dependent children who lived with you

Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE ▶

Your present employer

Wife's present employer

City and State where employed

City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, **BOTH HUSBAND AND WIFE MUST SIGN** even if only one had income.

Date

760968

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages[1] paid in 1966

Type or print EMPLOYEE'S social security number →

[1] Includes tips reported by employee. This amount is before payroll deductions [illegible]
[2] This block is for use in reporting salary [illegible] compensation which was not subject to [illegible] See Circular E.
[3] One twelfth of this amount was withheld [illegible] the cost of Hospital Insurance Benefits. The [illegible] is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared

Type or print EMPLOYEE'S name and address above

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER See instructions on back of copy D

450

Form **1040 A** **U.S. Individual Income Tax Return** (Less than $10,000 total income) **196**

Please print →

1. Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
☐ a. Single;
☐ b. Married filing joint return (even if only one had income);
☐ c. Married filing separately — If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from **separate** to joint or joint to separate returns, enter 1964 names and **addresses.**

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	**balance due** ▶	
11. If item 9 is larger than item 8, enter	**refund** ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 26094A

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind
Yourself	☐	☐	☐
Wife	☐	☐	☐

Enter number of exemptions checked ▶▶▶

13. First names of your dependent children who lived with you

Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE ▶

Your present employer	Wife's present employer
City and State where employed	City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. Date

260948A

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages [1] paid subject to withholding in 1966	Other compensation [2] paid in 1966	F.I.C.A. employee tax withheld [3]	Total F.I.C.A. wages paid in 1966

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared

FORM W-2— U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

451

431

NOTE: If your income is $5000 or more per year, you will need to complete the tax computation schedule at the bottom of page 453.

1. Enter total income from item 7.
2. Enter standard deduction, which is 10% of item 7, but not less than the minimum standard deduction, which is an amount equal to $200 plus $100 for each exemption claimed in item 15.

   Example: For husband and wife filing joint return claiming 4 dependent children, minimum standard deduction is $800 ($200 plus $100 for each of six exemptions.) The deduction is limited to $1000 on form 1040A.
3. Subtract line 2 from line 1.
4. Multiply $600 by the total number of exemptions.
5. Subtract line 4 from line 3.
6. Use tax rate schedule to determine amount of tax on line 6.

   On tax rate schedule, p. 454

   Schedule I is used for single persons.

   Schedule II for married tax payers filing joint returns and certain widows.

   Schedule III for unmarried tax persons who qualify as head of the household.

YOUR COPY—KEEP FOR YOUR RECORDS

Form **1040A** U.S. Treasury Department Internal Revenue Service

U.S. Individual Income Tax Return

If item 7 is $10,000 or more, or if interest, dividends, and nonwithheld wages are over $200, use Form 1040.

1966

Please print.

① Name (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and ZIP code

② **Your social security number** (Husband's if joint return)

③ **Wife's number, if joint return**

4. Check one:
- ☐ a. Single;
- ☐ b. Married filing joint return (even if only one had income);
- ☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◄

Enter the name and address used on your return for 1965. (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1965 names and addresses.

⑤	Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶ Wife's ▶
⑥a	Interest	Yours ▶ Wife's ▶
⑥b	Dividends: Yours—before exclusion $ .... After ▶ (See inst.) Wife's—before exclusion $ .... After ▶	
⑦	Total income (add items 5, 6a, and 6b)	▶
⑧	Tax from Tax Table or tax computation schedule	▶
⑨	Total Federal income tax withheld (from Forms W-2)	▶
⑩	If item 8 is larger than item 9, enter	Balance due ▶
⑪	If item 9 is larger than item 8, enter	Refund ▶

If your income was $5,000 or more, you must compute your tax. If income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11 (but, complete item 9). If you compute your own tax, pay balance (item 10) in full with return to your District Director.

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE.

⑫ **EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income)**
Check boxes which apply→

	Regular	65 or over	Blind
Yourself	☐	☐	☐
Wife	☐	☐	☐

Enter number of exemptions checked ▶▶▶

⑬ First names of your dependent children who lived with you ....

.... Enter number ▶

⑭ **DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.**

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer | Wife's present employer

City and State where employed | City and State where employed

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ **if appropriate.**

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

' If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. Date

TAX COMPUTATION SCHEDULE *(Use only if total income, item 7 of Form 1040A, is $5,000 or more)*

1. Enter total income from item 7 of Form 1040A........ $........
2. Enter the standard deduction which is explained on page 2 of the instructions (married person filing a separate return cannot claim more than $500)........
3. Subtract line 2 from line 1........
4. Multiply $600 by total number of exemptions claimed in item 15 of Form 1040A........
5. Subtract line 4 from line 3........
6. Tax on amount on line 5. Use appropriate tax rate schedule below. Enter here and in item 8 of Form 1040A (Do not attach this schedule to Form 1040A)........ $........

If you are a single taxpayer or a married taxpayer filing a separate return, use this tax rate schedule

If the amount on line 5 is:

Over	*But not over*	Enter on line 6:
$0	$500	14% of the amount on line 5
$500	$1,000	$70, plus 15% of excess over $500
$1,000	$1,500	$145, plus 16% of excess over $1,000
$1,500	$2,000	$225, plus 17% of excess over $1,500
$2,000	$4,000	$310, plus 19% of excess over $2,000
$4,000	$6,000	$690, plus 22% of excess over $4,000
$6,000	$8,000	$1,130, plus 25% of excess over $6,000
$8,000	$9,999.99	$1,630, plus 28% of excess over $8,000

If you are married taxpayers filing a joint return, use this tax rate schedule

If the amount on line 5 is:

Over	*But not over*	Enter on line 6:
$0	$1,000	14% of the amount on line 5
$1,000	$2,000	$140, plus 15% of excess over $1,000
$2,000	$3,000	$290, plus 16% of excess over $2,000
$3,000	$4,000	$450, plus 17% of excess over $3,000
$4,000	$8,000	$620, plus 19% of excess over $4,000
$8,000	$9,999.99	$1,380, plus 22% of excess over $8,000

TAX RATE SCHEDULES

If you do not use one of the Tax Tables, then figure your tax on the amount on line 11d, page 1 of your return by using the appropriate tax rate schedule on this page.

Schedule I. SINGLE TAXPAYERS not qualifying for rates in Schedules II and III, and **MARRIED PERSONS FILING SEPARATE RETURNS.**

If the amount on line 11d, page 1, is:		*Enter on line 12, page 1:*	
Not over $500		14% of the amount on line 11d.	
Over—	*But not over—*		*of excess over—*
$500	— $1,000	$70, plus 15%	— $500
$1,000	— $1,500	$145, plus 16%	— $1,000
$1,500	— $2,000	$225, plus 17%	— $1,500
$2,000	— $4,000	$310, plus 19%	— $2,000
$4,000	— $6,000	$690, plus 22%	— $4,000
$6,000	— $8,000	$1,130, plus 25%	— $6,000
$8,000	— $10,000	$1,630, plus 28%	— $8,000
$10,000	— $12,000	$2,190, plus 32%	— $10,000
$12,000	— $14,000	$2,830, plus 36%	— $12,000
$14,000	— $16,000	$3,550, plus 39%	— $14,000
$16,000	— $18,000	$4,330, plus 42%	— $16,000
$18,000	— $20,000	$5,170, plus 45%	— $18,000
$20,000	— $22,000	$6,070, plus 48%	— $20,000
$22,000	— $26,000	$7,030, plus 50%	— $22,000
$26,000	— $32,000	$9,030, plus 53%	— $26,000
$32,000	— $38,000	$12,210, plus 55%	— $32,000
$38,000	— $44,000	$15,510, plus 58%	— $38,000
$44,000	— $50,000	$18,990, plus 60%	— $44,000
$50,000	— $60,000	$22,590, plus 62%	— $50,000
$60,000	— $70,000	$28,790, plus 64%	— $60,000
$70,000	— $80,000	$35,190, plus 66%	— $70,000
$80,000	— $90,000	$41,790, plus 68%	— $80,000
$90,000	— $100,000	$48,590, plus 69%	— $90,000
$100,000		$55,490, plus 70%	— $100,000

Schedule II. MARRIED TAXPAYERS FILING JOINT RETURNS and **CERTAIN WIDOWS AND WIDOWERS (See page 4).**

If the amount on line 11d, page 1, is:		*Enter on line 12, page 1:*	
Not over $1,000		14% of the amount on line 11d.	
Over—	*But not over—*		*of excess over—*
$1,000	— $2,000	$140, plus 15%	— $1,000
$2,000	— $3,000	$290, plus 16%	— $2,000
$3,000	— $4,000	$450, plus 17%	— $3,000
$4,000	— $8,000	$620, plus 19%	— $4,000
$8,000	— $12,000	$1,380, plus 22%	— $8,000
$12,000	— $16,000	$2,260, plus 25%	— $12,000
$16,000	— $20,000	$3,260, plus 28%	— $16,000
$20,000	— $24,000	$4,380, plus 32%	— $20,000
$24,000	— $28,000	$5,660, plus 36%	— $24,000
$28,000	— $32,000	$7,100, plus 39%	— $28,000
$32,000	— $36,000	$8,660, plus 42%	— $32,000
$36,000	— $40,000	$10,340, plus 45%	— $36,000
$40,000	— $44,000	$12,140, plus 48%	— $40,000
$44,000	— $52,000	$14,060, plus 50%	— $44,000
$52,000	— $64,000	$18,060, plus 53%	— $52,000
$64,000	— $76,000	$24,420, plus 55%	— $64,000
$76,000	— $88,000	$31,020, plus 58%	— $76,000
$88,000	— $100,000	$37,980, plus 60%	— $88,000
$100,000	— $120,000	$45,180, plus 62%	— $100,000
$120,000	— $140,000	$57,580, plus 64%	— $120,000
$140,000	— $160,000	$70,380, plus 66%	— $140,000
$160,000	— $180,000	$83,580, plus 68%	— $160,000
$180,000	— $200,000	$97,180, plus 69%	— $180,000
$200,000		$110,980, plus 70%	— $200,000

Schedule III. Unmarried (or legally separated) **taxpayers who qualify as HEAD OF HOUSEHOLD (See page 4).**

If the amount on line 11d, page 1, is:		*Enter on line 12, page 1:*	
Not over $1,000		14% of the amount on line 11d.	
Over—	*But not over—*		*of excess over—*
$1,000	— $2,000	$140, plus 16%	— $1,000
$2,000	— $4,000	$300, plus 18%	— $2,000
$4,000	— $6,000	$660, plus 20%	— $4,000
$6,000	— $8,000	$1,060, plus 22%	— $6,000
$8,000	— $10,000	$1,500, plus 25%	— $8,000
$10,000	— $12,000	$2,000, plus 27%	— $10,000
$12,000	— $14,000	$2,540, plus 31%	— $12,000
$14,000	— $16,000	$3,160, plus 32%	— $14,000
$16,000	— $18,000	$3,800, plus 35%	— $16,000
$18,000	— $20,000	$4,500, plus 36%	— $18,000
$20,000	— $22,000	$5,220, plus 40%	— $20,000
$22,000	— $24,000	$6,020, plus 41%	— $22,000
$24,000	— $26,000	$6,840, plus 43%	— $24,000
$26,000	— $28,000	$7,700, plus 45%	— $26,000
$28,000	— $32,000	$8,600, plus 46%	— $28,000
$32,000	— $36,000	$10,440, plus 48%	— $32,000
$36,000	— $38,000	$12,360, plus 50%	— $36,000
$38,000	— $40,000	$13,360, plus 52%	— $38,000
$40,000	— $44,000	$14,400, plus 53%	— $40,000
$44,000	— $50,000	$16,520, plus 55%	— $44,000
$50,000	— $52,000	$19,820, plus 56%	— $50,000
$52,000	— $64,000	$20,940, plus 58%	— $52,000
$64,000	— $70,000	$27,900, plus 59%	— $64,000
$70,000	— $76,000	$31,440, plus 61%	— $70,000
$76,000	— $80,000	$35,100, plus 62%	— $76,000
$80,000	— $88,000	$37,580, plus 63%	— $80,000
$88,000	— $100,000	$42,620, plus 64%	— $88,000
$100,000	— $120,000	$50,300, plus 66%	— $100,000
$120,000	— $140,000	$63,500, plus 67%	— $120,000
$140,000	— $160,000	$76,900, plus 68%	— $140,000
$160,000	— $180,000	$90,500, plus 69%	— $160,000
$180,000		$104,300, plus 70%	— $180,000

Compute income tax for the following examples:

Example 1: A single taxpayer earned $5250 in 1967.

Solution:

1.	Total income from item 7	$5240
2.	Standard deduction (10% of income)	524
3.	(Subtract 2 from 1.)	$4716
4.	$600 x 1 exemption	600
5.		$4116

On Tax Schedule, page 454 , table I, $4116 is between $4000 and $6000 so the tax is $690 plus 22% of excess over $2000.

$4116 - $4000 = $116

.22 x $116 = $ 25.52

$ 690 + $25.52= $715.52

Example 2: A married couple without children both working earning $8615 total wages.

Solution:

1.	Total income from item 7	$8615.00
2.	Standard deduction (10% of income)	861.50
3.	(Subtract 2 from 1.)	$7753.50
4.	$600 x 2 exemptions	1200.00
		$6553.50

On tax schedule, page 454 , schedule II, the tax is $620 plus 19% of excess over $4000.

$6553.50 - $4000.00 = $2553.50

.10 x $2553.50 = $485.07

$620.00 + $485.07 = $1105.07

Example 3: A widow with 4 children receives an income of $4416.

Solution:

1.	Total income from item 7	$4416
2.	Standard deduction	500
3.		$3916
4.	$600 x 5 exemptions	3000
5.		916

In schedule II, the tax is 14% of line 5.

.14 x $916 = $128.24

Since the income in this example is less than $5000, you could have used the tax table on page 444 and found the tax to be $105.00

It is advisable to use the method that is most economical for you.

11-11 EXERCISES B: Find the tax for the following taxable incomes using the tax rate schedule.

	Wages	Status	Tax Rate	Tax
1.	$3945	single	______	______
2.	$10,841	married (3 dependents)	______	______
3.	$5,260	married (2 dependents)	______	______
4.	$12,500	married (3 children) (5 dependents)	______	______
5.	$6,090	unmarried (2 dependents (head of household)	______	______
6.	$150,000	unmarried (3 dependents) (head of household)	______	______
7.	$8,125	married (2 children) (4 dependents)	______	______
8.	$9,658	married (6 dependents)	______	______
9.	$18,150	married(3 dependents)	______	______
10.	$7450	married (2 dependents)	______	______

TAX COMPUTATION SCHEDULE (Use only if total income, item 7 of Form 1040A, is $5,000 or more)

1. Enter total income from item 7 of Form 1040A $............

2. Enter the standard deduction which is explained on page 2 of the instructions (married person filing a separate return cannot claim more than $500) ____________

3. Subtract line 2 from line 1 ....

4. Multiply $600 by total number of exemptions claimed in item 15 of Form 1040A ____________

5. Subtract line 4 from line 3 ____________

6. Tax on amount on line 5. Use appropriate tax rate schedule. Enter here and in line 8 of Form 1040A $............

TAX COMPUTATION SCHEDULE (Use only if total income, item 7 of Form 1040A, is $5,000 or more)

1. Enter total income from item 7 of Form 1040A $............

2. Enter the standard deduction which is explained on page 2 of the instructions (married person filing a separate return cannot claim more than $500) ____________

3. Subtract line 2 from line 1 ....

4. Multiply $600 by total number of exemptions claimed in item 15 of Form 1040A ____________

5. Subtract line 4 from line 3. ____________

6. Tax on amount on line 5. Use appropriate tax rate schedule. Enter here and in line 8 of Form 1040A $............

11-12 Review

1. A washer priced at $189.50 cash can be purchased for $25 down and installments of $15.65 per month for 12 months. Find the difference between the cash price and the installment price.

2. The cash price of a kitchen table and four chairs is $140. Use tables on page   to find the monthly payments, if the payment period is 18 months. What was the time balance? What is the difference between the installment price and the cash price? What is the monthly payment?

3. Make out an invoice for the purchase of a 1967 Volkswagon listed at $1850. Extras include undercoating $19, radio $43.75 and exterior mirror $12.50. The registration fee is $13. The cash deposit is $200. Add 3½% sales tax price of the car. Determine the monthly payments for two years, if the finance charge is 18% of the cash difference.

4. Mr. Sloan purchased a house on White Rock Drive for $25,000. He paid $8,500 down and signed a mortgage to pay the balance in 20 years at the rate of $76.52 per month. How much interest did he pay on the mortgage during 20 years?

5. Complete these bank stubs:

Start with a bank balance of $129.58. Deposit $180.

Check no. 100	$ 14.30
Check no. 101	$ 36.97
Check no. 102	$127.42
Check no. 103	$ 10.95
Check no. 104	$ 8.43
Check no. 105	$ 28.93

6. Determine the balance for this bank statement:

Checks	Code	Checks	Code	Deposits	Balance
					$416.54
$ 6.70		$13.98			
$24.15		$ 1.50	1		
$11.30				$156.45	
$16.00		$34.69			
$21.39		$76.52			
$55.60				$ 81.27	______

Code: 1 - Service Charge

Balance at beginning		Deposits		Checks		Service charges		Balance
	+		−		−		=	

7. If you borrowed $75 on April 13 at 5% for 45 days, what was the bank discount and the net proceeds? What is the date of maturity?

8. Use the 60 day 6% method for the following:

   a) Find the interest on $45 for 60 days at 6%

   b) Find the interest on $142 for 75 days at 6%

   c) Find the interest on $50 for 60 days at 4%

   d) Find the interest on $240 for 90 days at 5%

9. Find the interest on $300 at 5% compounded semi-annually for 2 years. Compute interest added each 6 month period based on the new principal to find the amounts, at end of each interest period. Show the amount at the end of 2 years and the difference between the original principal and amount in your savings account after 2 years (interest).

10. Use the annual compound interest table on page 318 to compute the interest on $1200 at 6% compounded quarterly for 3 years.

11. If you cashed in three $25 Series E U.S. Savings Bonds after 5 years, how much cash would you receive? How much interest would these 3 bonds have accumulated in 5 years?

12. If you had a $50 Freedom Share, how much interest would it have earned in 3 years?

13. Mr. Fontaine wants to buy 50 shares of United Illuminating Company stock at 32½ per share (asked price). How much will this order cost? What will the commission be at rates charged at N.Y. Stock Exchange? If the annual dividends are $1.76 per share, how much will he receive per year in dividends? How much will he receive as quarterly dividend? What is the annual % of earnings to nearest tenth per cent?

Use the yearly premium chart for life insurance on p. 401 for the following problems.

14. George Fomer who is 30 years old bought a house for $13,500. He has a $11,000 mortgage on it. What is the annual premium for a 20 year term insurance policy? How much would he pay for the insurance for 20 years?

15. If you take out a straight life policy for $5000 at age 20, what is the annual premium? How much would you pay in premiums, if you pay until you are 65 years of age?

16. If you take out a twenty payment life policy for $10,000 at age 25, what is your annual premium? What is the cost of 20 premiums? How much more than you have paid in premiums, would your policy be worth?

17. If you take out a $2000 endowment life policy at age 20 to receive benefits at age 60, what will the annual premiums be?

18. If you wanted to be able to retire at age 60, what would the annual premiums be on an endowment policy for $20,000 be if you took out the policy at age 30?

Use rates for automobile insurance from table 10, p 411

19. Mr. Campbell who lives at 9176 Madison Street in Hartford owns and drives a 1967 Pontiac. His wife, 23 year old son, and 19 year old daughter also drive the family car. Find the premiums for:

liability insurance: 50/100 for bodily injury
$10,000 property damage

full coverage comprehensive

$50 deductible collision

Complete the following chart:

	Manual	Number of Accidents				
		none	one	two	three	four
Liability						
Bodily injury						
Property damage						
Comprehensive						
Collision						
Total annual premium						

20. Mr. Roberts has a home protection insurance policy. It is covered for fire, theft, and windstorm. It is a one family frame house. What is the premium for a three year policy if the home is valued at $13,500, the contents at 20% of the value of the house, and additional living expenses at 10% of the face of the policy? form 1 no. 1

21. A house on Park Road, Windsor is valued at $15,800. It is assessed at *65%* of its value. What is the property tax if the rate is 38.0 mills in Windsor?

22. Make out a tax bill for 1965 Thunderbird valued at $3200. The car is owned by William S. Hughes, 168 Conard Drive, West Hartford. The tax rate in West Hartford is 46.5 mills.

23. Bill Thayer who does maintenance work for the city of Hartford earns $3.20 per hour. How much social security tax is withheld from his weekly wage? What is the FICA employee tax shown on his form W-2? What is the total amount contributed during the year toward his S.S. account?
He works 40 hours per week.

24. Make out the 1040A income tax statement for William K. Thayer. He has a wife, a son, Bill, and a daughter, Gloria. He is entitled to four exemptions at $600 each and 10% of his income for standard deduction. Find his income tax.

25. The gasoline tax in Connecticut is 4¢ Federal tax and 7¢ State tax per gallon of gasoline. If your car uses 14 miles per gallon and you have driven 12,000 miles during 1967, how many gallons of gasoline did you use? How much state gasoline tax did you pay? What was the total gasoline tax?

11-12 Review no. 4

1. Price of Car		
2. Extras		
3.		
4.		
5.		
6. List Price plus extras		(Cost of car with extras)
7. Sales tax		($3\frac{1}{2}$% of cost of car)
8. Title Fee and Registration		
9. Total Price		(Total cost inc. sales tax and title fee and registration)
SETTLEMENT		
10. Cash Deposit		
11. Cash on Delivery		
12. Used Car		
13. Total Allowance		(Cash payment and other allowances)
14. Cash difference		(Total price - total allowances)
15. Finance Charge		(12% of cash difference)
16. Time Balance		(Cash difference + finance charge)
17. Time ______ months		
18. Monthly Payments		(Time balance no. months)

11-12 Review no. 5

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

NO
19
TO
FOR

	DOLLARS	CENTS
BAL BROT FORD		
AMT DEPOSITED		
" " "		
" " "		
TOTAL •		
AMT THIS CHECK		
BAL CARD FORD		

11-12 Review No. 22

CITY OF HARTFORD **TAX BILL** **196** LIST **REAL PROPERT**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office ....
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail ....
SEND IN PROPER STUB.
If receipt is desired by mail........
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION	ACCOUNT NO. L 6456
OWNER	

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

Matters pertaining to assessment should be taken up with the Assessor.

$ Gross Valuation	$ Exemption	$ Net Valuation	Tax Rate

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH

1 PAYM'T DUE APRIL 1, 1966	2 PAYM'T DUE JULY 1, 1966	3 PAYM'T DUE OCT. 1, 1966	4 PAYM'T DUE JAN. 1, 1967

CITY OF HARTFORD **TAX BILL** **196** LIST **REAL PROPERTY**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office ....
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail ....
SEND IN PROPER STUB.
If receipt is desired by mail........
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION

ACCOUNT NO. L 6456

OWNER

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

Matters pertaining to assessment should be taken up with the Assessor.

$ Gross Valuation | $ Exemption | $ Net Valuation | Tax Rate

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

1 PAYM'T DUE APRIL 1, 1966 | 2 PAYM'T DUE JULY 1, 1966 | 3 PAYM'T DUE OCT. 1, 1966 | 4 PAYM'T DUE JAN. 1, 1967

CITY OF HARTFORD **TAX BILL** **196** LIST **REAL PROPERTY**

Make Checks Payable To: JOHN D. CURTIN, TAX COLLECTOR Mail To: 550 Main St., Hartford, Conn. 06103

When making payment at office ....
PRESENT COMPLETE BILL AND STUBS.
When making payment by mail ....
SEND IN PROPER STUB.
If receipt is desired by mail........
INCLUDE SELF-ADDRESSED STAMPED ENVELOPE AND COMPLETE BILL.

LOCATION OR DESCRIPTION

ACCOUNT NO. L 6456

OWNER

TOTAL TAX DUE

ANY TAX UNDER $50.00 MUST BE PAID IN FULL DURING APRIL

Matters pertaining to assessment should be taken up with the Assessor.

$ Gross Valuation | $ Exemption | $ Net Valuation | Tax Rate

FAILURE TO PAY ANY QUARTERLY PAYMENT WITHIN ONE MONTH OF DUE DATE - - MAKES ENTIRE BALANCE DELINQUENT. INTEREST MUST BE CHARGED WITH EACH SUBSEQUENT PAYMENT AT THE RATE OF ½ OF 1% PER MONTH.

1 PAYM'T DUE APRIL 1, 1966 | 2 PAYM'T DUE JULY 1, 1966 | 3 PAYM'T DUE OCT. 1, 1966 | 4 PAYM'T DUE JAN. 1, 1967

Form **1040 A** **U.S. Individual Income Tax Return** (Less than $10,000 total income)

1965

Please print → 1. **Name** (If a joint return of husband and wife, use first names and middle initials of both)

Home address (Number and street or rural route)

City, town or post office, State and Postal ZIP code

2. Your social security number (Husband's if joint return)

3. Wife's number, if joint return

4. Check one:
☐ a. Single;
☐ b. Married filing joint return (even if only one had income);
☐ c. Married filing separately—If your husband or wife is also filing a return give his or her first name and social security number. ◀

If item 7 is $10,000 or more, or if interest, dividends and non-withheld wages are over $200, use Form 1040.

Enter the name & address used on your return for 1964 (If the same as above, write "Same.") If none filed, give reason. If changing from separate to joint or joint to separate returns, enter 1964 names and addresses.

If your income was $5,000 or more, you must compute your tax. However, if your income was less than $5,000, you may have the Internal Revenue Service compute your tax by omitting items 8, 10, and 11. If you compute your own tax, pay balance (item 10) in full with return to your District Director.

5. Enter total wages, salaries, tips, etc. Enclose Forms W-2, Copy B. If not shown on enclosed Forms W-2 attach explanation.	Yours ▶	
	Wife's ▶	
6. Interest and dividends	Yours ▶	
	Wife's ▶	
7. Total income (add items 5 and 6)	▶	
8. Tax from Tax Table or tax computation schedule	▶	
9. Total Federal income tax withheld (from Forms W-2)	▶	
10. If item 8 is larger than item 9, enter	**balance due** ▶	
11. If item 9 is larger than item 8, enter	**refund** ▶	

Apply refund to: ☐ **U.S. Savings Bonds, & excess refunded; or** ☐ **Refund only.**

U.S. TREASURY DEPARTMENT • INTERNAL REVENUE SERVICE

(OVER) LIST YOUR EXEMPTIONS AND SIGN ON OTHER SIDE. 260944

---

12. EXEMPTIONS FOR YOURSELF—AND WIFE (only if all her income is included in this return, or she had no income) Check boxes which apply →

	Regular	65 or over	Blind
Yourself	☐	☐	☐
Wife	☐	☐	☐

Enter number of exemptions checked ▶▶▶

13. First names of your dependent children who lived with you ....

Enter number ▶

14. DEPENDENTS OTHER THAN THOSE CLAIMED IN ITEM 13.

(a) NAME ▶ Enter figure 1 in the last column to right for each name listed (if more space is needed, attach schedule)	(b) Relationship	(c) Months lived in your home. If born or died during year also write "B" or "D"	(d) Did dependent have income of $600 or more?	(e) Amount YOU furnished for dependent's support. If 100% write "ALL"	(f) Amount furnished by OTHERS including dependent. See instruction 14	
				$	$	▶
						▶
						▶

15. TOTAL EXEMPTIONS FROM ITEMS 12, 13, AND 14 ABOVE .... ▶

Your present employer	**Wife's present employer**
City and State where employed	**City and State where employed**

If you had an expense allowance or charged expenses to your employer, see instructions for "Reimbursed Expenses" and check here ☐ if appropriate.

Sign here ▶ Under penalties of perjury, I declare that to the best of my knowledge and belief this is a true, correct, and complete return.

If joint return, BOTH HUSBAND AND WIFE MUST SIGN even if only one had income. **Date**

260944A

1

WAGE AND TAX STATEMENT 1966

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages[1] paid subject to withholding in 1966	Other compensation[2] paid in 1966	F.I.C.A. employee tax withheld[3]	Total F.I.C.A. wages paid in 1966

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Includes tips reported by employee. This amount is before payroll deductions or "sick pay" exclusions.

[2] This block is for use in reporting salary or other compensation which was not subject to withholding. See Circular E.

[3] One-twelfth of this amount was withheld to finance the cost of Hospital Insurance Benefits. The remainder is for old-age, survivors, and disability insurance.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared ....

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

467

447

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

GENERAL MATHEMATICS
machine calculator course

a text-workbook
BOOK 4

PART 2

1967
revised

HARTFORD PUBLIC SCHOOLS PRODUCTION

FOREWARD

The machine calculator course, originally introduced for tenth grade mathematics students in September of 1966, has undergone an ambitious revision conducted by a mathematics research and development team under the ESEA, Title I, grant. Under the direction of G. William Saxton, Director of Secondary Education, Hartford Board of Education, the course materials have been developed by the following team members: Stephen J. Ucich, chairman of the team, department of mathematics, Hartford Public High School; Robert C. Mogensen, department of mathematics, Hartford Public High School; Marie M. Gubitz, department of mathematics, Weaver High School; William R. Johnson, department of mathematics, Windsor High School.

The course is intended to meet the needs of students who have exhibited a lack of problem-solving skills. Employing electric desk calculators to rid students of the frustration of computational drudgery, a new learning setting in which students can succeed has released them to read and analyze problems to a greater extent. These problems are directly related to the world of work that students may enter upon graduation.

The efforts of the first curriculum team in the summer of 1966 were directed toward the development of authentic, practical, problems obtained from business and industry in the greater Hartford area. With a year of valuable experience as a guide, the team has reorganized the course content from its originally exclusive problem-solving approach to a text-workbook format.

It was felt that students needed a basic review of arithmetic skills before they attempted to solve problems. In the first four chapters students learn how to use the machine while reviewing the basic operations with whole numbers, decimal numbers, fractions, and per cents. Next, a transitional chapter stresses the combining of these operations, so necessary for the solution of the detailed problems that follow.

In chapters 6 and 7 students first encounter problems that are within the framework of their own experience and are then gradually introduced to the more simple business oriented applications.

Chapters 8, 9, and 10 deal with the use of formulas and measurement of plane surfaces and solid figures, preparing students to extend this knowledge into the mathematics of everyday living and the more difficult practical problems from business and industry.

The intent of this order of course materials is to allow students to move toward independent achievment with greater confidence in solving problems that are new to them, thus creating the realistic atmosphere of the business world.

The objectives of the course are to be evaluated by pre-test and post-test scores on a mathematics achievment test designed by the team. The results should indicate the direction of possible future revisions to insure that educational offerings in mathematics are continually updated to meet the needs of our youth.

Looking ahead, the possibility of extending machine oriented mathematics courses to students in other grades certainly should not be discounted. Research in this field may reveal a need to offer the college bound student, as well as the student who will immediately enter the labor market, an opportunity to pursue mathematics for a deeper and more meaningful understanding of its principles.

Robert C Miles

Dr. Robert C. Miles
Assistant Superintendant
in Charge of Instruction

TABLE OF CONTENTS

Chapter XI Daily Math

Page

11-1 Installment Buying 341

11-1D Completing Invoices for Buying a Car on the Installment Plan 357

11-1F Installment Buying - Mortgages 362

11-2 Paying Bills 363

11-2A Paying Bills by Check 363

11-2B Writing Checks 364

11-2C Bank Statement for a Checking Account 370

11-3 Consumer Borrowing 374

11-3C Finding Bank Discount and Proceeds 376

11-3D Savings Account 377

11-3E Savings Account 378

11-3G Finding Interest and Amount 380

11-3H Finding Interest Using the 6% - 60 Day Method 381

11-3L Compound Interest 384

11-3N Compound Interest - Using Tables 388

11-4 United States Savings Bonds 391

11-4A Series E Savings Bonds 391

11-4B Series H Savings Bonds 391

11-4C Freedom Shares 392

11-5 Stocks 395

11-5B Brokerages Charges 396

11-6 Life Insurance 398

11-7 Automobile Insurance 407

Chapter XI - Continued

Page

11-8 Home Protection Insurance 416
11-9 Property Tax 422
11-10 Social Security 433
11-11 Income Taxes 439
11-12 Review 458

Chapter XII Practical Problems from Business

12-1 Introduction 468
12-2 Different Kinds of Lumber 468
12-3 Finding the Cost of Lumber (Price per Piece) 469
12-4 Finding the Cost of Lumber (Price per Lineal Foot) 474
12-5 Finding the Cost of Lumber (Price per Thousand Board Feet) 477
12-6 Finding the Cost of Plywood (Price per Sq. Ft.) 482
12-7 Other Products Sold by Lumber Companies 486
12-8 Installation of Glass and Related Aluminum Products ... 489
12-9 Shipment and Billing of Fractional Parts of an Order .. 496
12-10 Computing the Cost of Steel Chain 505
12-11 Yearly State Tax Collections 508
12-12 Comparing Monthly State Tax Collections 510
12-13 Unincorporated Business Tax 514
12-14 Reading an Electric Watt-Hour Meter 518
12-15 Find the Difference Between Two Meter Readings 521
12-16 Finding the Cost of Electricity 522
12-17 Computing Electric Bills By Using Formulas 526
12-18 Analysis of Rate Reduction 528
12-19 Computing Gas Bills 529
12-20 Computing Fuel Oil Bills 533
12-21 Review Exercises 537

Chapter 12

PRACTICAL PROBLEMS FROM BUSINESS

CHAPTER XII
Practical Problems From Business

12-1 Introduction

In this chapter you will find cost problems taken directly from business. You will find that the solving of these problems depends on how well you understand the terminology of pricing. The ways that prices are stated give a clue as to what you must first find in the problems. Pay close attention to such statements as $.36 per piece, 6¢ per lineal ft., 8.25¢ per KWH, 16.8¢ per gal. These phrases tell you how to do the pricing.

12-2 Different Kinds of Lumber

Lumber is wood. Other names for lumber are boards and planks.

There are three kinds of lumber. One kind is called frame lumber, another is called siding, and the third finish lumber.

Frame lumber is used in building homes, garages porches, sheds, etc. If you have seen a new home being built, you have probably noticed that it looks like a skeleton at first. This is the frame of the house. Our bones, or skeleton, could be thought of as being the frame for our house (our body).

Siding is nailed to the frame of the home. Siding covers the sides, roof, and floors. Most often siding is made of plywood and comes in sheets, 4 ft. wide and 8 ft. long.

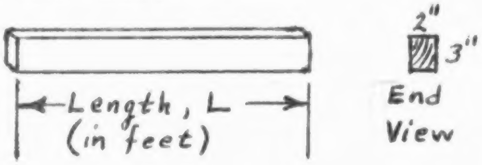
Finish lumber is used when the home is in the finished stages of construction. Finish lumber is used for closets, baseboards, doors, kitchen cabinets and trim work on the outside of the home.

12-3 Finding the Cost of Lumber (Price per Piece)

Frame lumber and finish lumber are sometimes priced at "so much per piece." The key words here are "per piece" - they tell you how to price the lumber. Look at the following price lists for frame and finish lumber. (2" x 3" is read "two by three")

FRAME LUMBER PRICE LIST

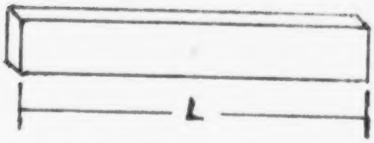
Description of Lumber: 2" x 3"

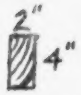


Size	L	Price per Piece
2 x 3	x 6'	$.36
2 x 3	x 8'	.48
2 x 3	x 10'	.60
2 x 3	x 12'	.72
2 x 3	x 14'	.84
2 x 3	x 16'	.96

A 2" by 3" piece of lumber that is 6 ft. long costs $.36.

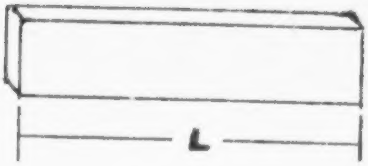
Description of Lumber: 2" x 4"

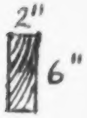




Size	L	Price per Piece
2 x 4	x 6'	$ .48
2 x 4	x 8'	.64
2 x 4	x10'	.80
2 x 4	x 12'	.96
2 x 4	x 14'	1.12
2 x 4	x 16'	1.28
2 x 4	x 18'	1.44

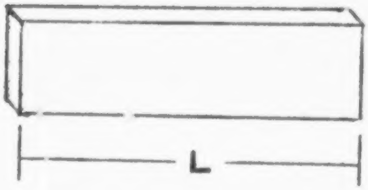
Description of Lumber: 2 x 6

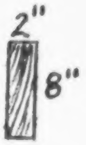




Size	L	Price per Piece
2 x 6	x 10'	$1.20
2 x 6	x 12'	1.44
2 x 6	x 14'	1.68
2 x 6	x 16'	1.92
2 x 6	x 18'	2.16
2 x 6	x 20'	2.40

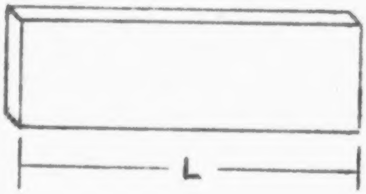
Description of Lumber: 2 x 8

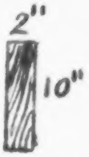




Size	L	Price per Piece
2 x 8	x 10	$1.60
2 x 8	x 12	1.92
2 x 8	x 14	2.24
2 x 8	x 16	2.56
2 x 8	x 18	2.88
2 x 8	x 20	3.20

Description of Lumber: 2 x 10

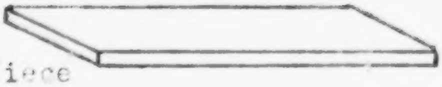


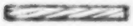


Size	L	Price per Piece
2 x 10	x 12	$2.40
2 x 10	x 14	2.80
2 x 10	x 16	3.20
2 x 10	x 18	3.60
2 x 10	x 20	4.00
2 x 10	x 22	4.40

FINISH LUMBER PRICE LIST

Description of Lumber





Size	L	Price per Piece
1 x 3	x 10	25¢ → A 1" x 3" piece of lumber that is 10 ft. long costs 25¢.
1 x 3	x 12	30¢
1 x 3	x 14	35¢
1 x 4	x 10	45¢
1 x 4	x 12	54¢
1 x 4	x 14	63¢
1 x 6	x 10	65¢
1 x 6	x 12	78¢
1 x 6	x 14	91¢
1 x 8	x 10	$ .90
1 x 8	x 12	1.08
1 x 8	x 14	1.26
1 x 10	x 12	1.38
1 x 10	x 14	1.61
1 x 10	x 18	2.07
1 x 12	x 16	2.56
1 x 12	x 18	2.88
1 x 12	x 20	3.20

12-3 Exercise A: Using the price lists for frame and finish lumber determine how much the following would cost. Round off answers to nearest cent.

	Number of Pieces	Kind of Lumber	Size	Length (feet)	Price per Piece	Cost
1.	1	Frame	2 x 3	10		
2.	2	Frame	2 x 6	20		
3.	5	Finish	1 x 8	12		
4.	8	Frame	2 x 4	8		
5.	12	Finish	1 x 4	14		
6.	20	Finish	1 x 3	10		
7.	56	Frame	2 x 10	20		

	Number of Pieces	Kind of Lumber	Size	Length (feet)	Price per Piece	Cost
8.	43	Frame	2 x 6	16		
9.	11	Finish	1 x 12	16		
10.	115	Frame	2 x 3	14		
11.	39	Finish	1 x 6	10		
12.	8	Finish	1 x 10	12		
13.	165	Frame	2 x 8	18		
14.	225	Frame	2 x 10	22		
15.	318	Frame	2 x 4	18		

12-3 EXERCISE 3: If sales tax is 3½%, find the cost of the following lumber orders. Use the price lists on the preceding pages. Round off answers to nearest cent.

16. 5 pcs., 2 x 4 x 12, Frame lumber @ $____ per pc. $
12 pcs., 2 x 6 x 18, Frame " @$____ per pc. $
12 pcs., 2 x 8 x 16, Frame " @ $____ per pc. $
24 pcs., 2 x 10 x 16, Frame " @ $____ per pc. $ ____________
Sub-Total $
Tax $ ____________
Total $

17. 8 pcs., 1 x 6 x 14, Finish $
8 pcs., 1 x 6 x 12, Finish
8 pcs., 1 x 3 x 14, Finish
8 pcs., 1 x 12 x 16, Finish
____
Sub-Total $
Tax $ ____________
Total $ ____________

18. 35 pcs., 2 x 10 x 20, Frame .... $

80 pcs., 2 x 8 x 20, Frame ....

120 pcs., 2 x 4 x 18, Frame ....

20 pcs., 1 x 4 x 10, Finish ....

24 pcs., 1 x 8 x 14, Finish ....

18 pcs., 1 x 6 x 14, Finish .... ____________

Sub-Total $____________

Tax $____________

Total $

19. The following lumber order is subject to a 15% discount and a 3½% sales tax.

14 pcs., 2 x 3 x 6, Frame .... $

82 pcs., 2 x 4 x 12, " ....

68 pcs., 2 x 6 x 14, " ....

44 pcs., 2 x 8 x 12, " ....

12 pcs., 1 x 8 x 10, Finish ....

4 pcs., 1 x 6 x 10, Finish ....

4 pcs., 1 x 4 x 10, Finish .... ____________

Sub-Total $

Discount $____________

Dis. Price $

Tax $____________

Total $

20. The following order is subject to successive discounts of 15-5 and a sales tax of 3½%.

14 pcs., 1 x 12 x 18, Finish .... $
35 pcs., 1 x 12 x 16, " ....
8 pcs., 1 x 10 x 14, " ....
12 pcs., 2 x 6 x 18, Frame .... ____________

Sub-Total $
First Discount $____________
First Net $
Second Discount $____________
Second Net $
Tax $____________
Total $

12-4 Finding the Cost of Lumber (Price per Lineal Foot)

In the preceding section you have seen that frame and finish lumber is priced at "so much per piece."

In this section you will find that frame and finish lumber is sometimes priced as "so much per lineal foot."

"Lineal" means "in a straight line." Some examples are:

A piece of rope, 30 ft. long, contains 30 lineal ft.
A chain, 100 ft. long, contains 100lineal ft.
A pipe, 22 ft. long, contains 22 lineal ft.
A coil of copper tubing may contain 50 lineal ft.
A coil of wire, 5,000 ft. long, contains 5000 lineal ft.
A board, 20 ft. long, contains 20 lineal ft.

It does not make any difference how thick the rope, chain, pipe, or board is. Thickness has nothing to do with length when the pricing is per lineal foot.

If the price of 2 x 4 lumber is 8¢ per lineal ft., then three boards each 2 x 4 x 6' will cost 3 x 6 x $.08 = $1.44.

The following is a price list for frame and finish lumber. The prices are given as "so much per lineal ft."

FRAME LUMBER		FINISH LUMBER	
Size	Price Per Lineal Ft.	Size	Price Per Lineal Ft.
2 x 3	6¢	1 x 3	2½¢
2 x 4	8¢	1 x 4	4½¢
2 x 6	12¢	1 x 6	6½¢
2 x 8	16¢	1 x 8	9 ¢
2 x 10	20¢	1 x 10	11½¢
		1 x 12	16 ¢

12-4 EXERCISES:

Using the price lists from section 12-4, determine the cost of the following. Round off answers to the nearest cent.

	Number of Pieces	Kind of Lumber	Size	Price Per Lineal Ft.	Cost
1.	1	Frame	2 x 3 x 10	$.06	$
2.	2*	Frame	2 x 4 x 12		
3.	8	Frame	2 x 10 x 22		
4.	4	Finish	1 x 8 x 12		
5.	10	Finish	1 x 3 x 14		
6.	25	Finish	1 x 6 x 12		
7.	12	Frame	2 x 6 x 18		
8.	28	Finish	1 x 4 x 14		
9.	32	Finish	1 x 12 x 20		
10.	45	Frame	1 x 10 x 12		

* This means there are 2 boards, each 2 x 4 x 6' long.

If sales tax is 3½%, find the cost of the following lumber orders. Round off to nearest cent.

11. 4 - 2 x 3 x 12, Frame lumber @ ____¢ per lineal ft. . $
12 - 2 x 6 x 14, " " @ ____¢ per " "
12 - 2 x 10 x 20, " " @ ____¢ per " "
6 - 1 x 4 x 12, Finish " @ ____¢ per " " __________
Sub-Total $
Tax $__________
Total $

12. Apply a 10% discount to this order.
18 - 2 x 4 x 18, Frame lumber .... $
40 - 2 x 6 x 18, " " ....
56 - 2 x 8 x 18, " " ....
12 - 2 x 10 x 18, " " .... __________
Sub-Total $
Discount $__________
Dis. Price $
Tax $__________
Total $

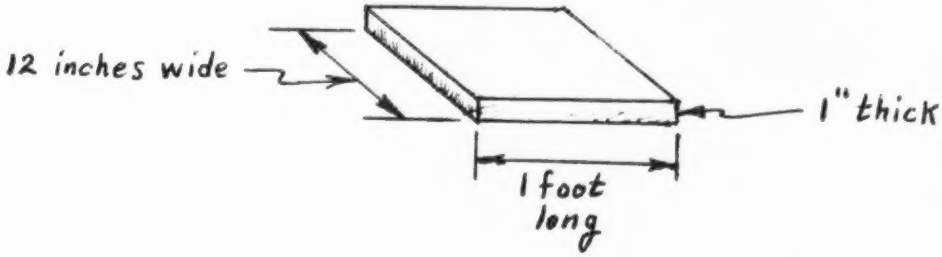
13. Apply a "builders discount" of 18% and a "pick-up" discount of 5% to this order.
15 - 1 x 12 x 16, Finish lumber .... $
12 - 1 x 10 x 18, " " ....
18 - 1 x 6 x 12, " " ....
14 - 1 x 4 x 12, " " .... __________
Sub-Total $
First Discount $__________
First Net $
Second Discount $__________
Second Net $
Tax $__________
Total $

12-5 Finding the Cost of Lumber (Price per Thousand Board Feet)

There is one more way that frame and finish lumber is priced. It is the pricing method that is most often used by lumber dealers. The method is called "so much per 1000 board feet."

First, what does "board feet" mean?

A board foot is a piece of lumber that is 1 inch thick, 12 inches wide, and 1 foot long.



The formula for finding the number of board feet in any piece of lumber is: Board Feet = $\frac{T \times W \times L}{12}$, where T is the Thickness of the board, in inches, W is the width, in inches, and L is the length of the board in feet.

Example 1: How many board feet are there in a 2" x 4" x 6' piece of frame lumber:

Solution: Board feet = $\frac{T \times W \times L}{12}$

" " $= \frac{2 \times 4 \times 6}{12} = 4$

Answer: There are 4 board feet.

Example 2: How many board feet are there in a 1 x 10 x 18, finish lumber?

Solution: Board feet = $\frac{T \times W \times L}{12}$

" " = $\frac{1 \times 10 \times 18}{12} = 15$

Answer: There are 15 board feet.

Example 3: How many board feet are there in 50 pieces of 2 x 4 x 12, frame lumber?

Solution: Board feet = $\frac{2 \times 4 \times 12}{12} = 8$ (in one piece)

Board feet in 50 pieces is 50 x 8 = 400, Ans.

The present cost of frame lumber is $120 per 1000 board feet. What would be the cost of the lumber in Example 3?

Solution:

a) The cost will be $120 for every 1000 board feet.

b) How many 1000's are there in 400?

$\frac{400}{1000} = .4$ thousands

c) Therefore, the cost of 400 board feet of lumber will be $120 x .4 = $48, Ans.

Example 4: What will be the cost of 37 pieces of 2 x 6 x 14 at a price of $120 per 1000 board feet?

Solution:

a) Board feet in one piece is $\frac{2 \times 6 \times 14}{12} = 14$.

b) Board feet in 37 pieces is 37 x 14 = 518

c) How many 1000's are there in 518?
$\frac{518}{1000} = .518$ (Do not round off.)

d) The cost of the lumber will be:
$120 x .518 = $62.16, Answer

A quicker w ay to do this same problem on your machine is to combine all of the factors involved:

$$\overbrace{\frac{2 \times 6 \times 14}{12}}^{\text{Board Feet in One Piece}} \times \overbrace{\frac{37}{1}}^{\text{Number of Pieces}} \times \overbrace{\frac{120}{1000}}^{\text{Price per 1000 bd. ft.}} = \frac{2 \times 6 \times 14 \times 37 \times 120}{12 \times 1000}$$

Next, multiply all of the factors in the numerator together.

Then, multiply all of the factors in the denominator together. Cost = $\frac{745,920}{12,000}$ = $62.16, Answer

The following is a price list for frame and finish lumber:

Frame lumber : any size @ $120 per 1000 board feet.
Finish lumber: any size @ $160 per 1000 board feet.

12-5 EXERCISES: Using the price list above, determine the cost of the following lumber orders. Use a sales tax of 3½%. Round off answers to nearest cent.

1. 40 - 2 x 4 x 12, Frame lumber .... $
   60 - 2 x 6 x 18, " " ....
   20 - 2 x 10 x 16, " " .... ____________
   Sub-Total $
   Tax $ ____________
   Total $
2. 12 - 1 x 12 x 20, Finish lumber .... $
   20 - 1 x 8 x 10, " " ....
   35 - 1 x 3 x 12, " " .... ____________
   Sub-Total $
   Tax $ ____________
   Total $

3. 18 - 2 x 3 x 14, Frame lumber .... $
27 - 2 x 8 x 10, " " ....
13 - 1 x 6 x 14, Finish lumber ....
19 - 1 x 4 x 12, " " .... ________

Sub-Total $
Tax $________
Total $

4. Apply successive discounts of 25-10 to the following order.

50 - 2 x 6 x 20, Frame lumber .... $
45 - 2 x 8 x 16, " " ....
35 - 2 x 10 x 20, " " ....
125 - 2 x 4 x 18, " " .... ________

Sub-Total $
First Discount $________
First Net $
Second Discount $________
Second Net $
Tax $________
Total $

5. Apply successive discounts of 40-25 and a 2% discount if the bill is paid within 10 days of receipt.

24 - 1 x 10 x 12, Finish lumber .... $
24 - 1 x 8 x 12, " " ....
40 - 1 x 4 x 14, " " ....
130 - 1 x 3 x 10, " " .... ____________

Sub-Total $
First Discount $____________
First Net $
Second Discount $____________
Second Net $
Tax $____________
Sub-Total $
2% Discount $____________
Final Bill $

6. Apply successive discounts of 35-10-5 and a 2% discount if the bill is paid within 10 days of receipt.

150 - 2 x 3 x 14, Frame lumber .... $
200 - 2 x 4 x 18, " " ....
250 - 2 x 6 x 20, " " .... ____________

Sub-Total $
First Discount $____________

First Net $
Second Discount $____________

Second Net $
Third Discount $____________

Third Net $
Tax $____________

Sub-Total $
2% Discount $____________

Total $

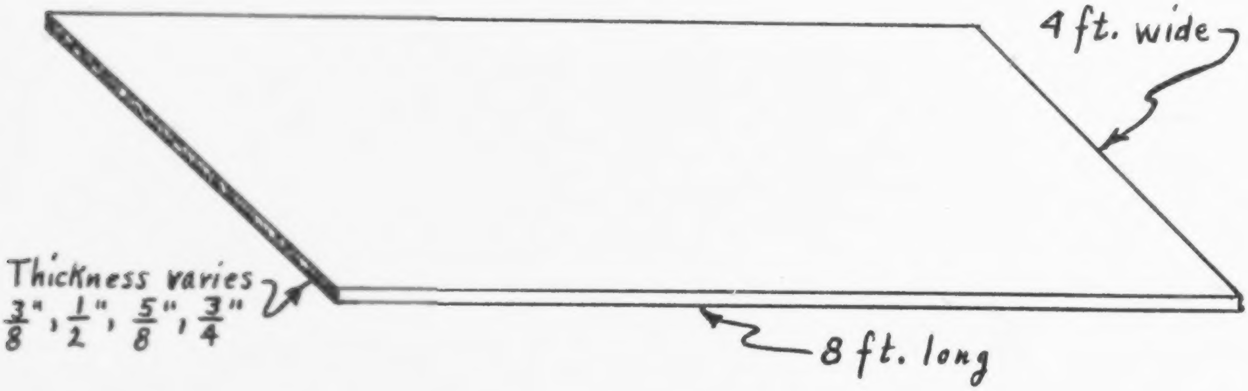
7. Apply a discount of 12% and a freight rate of $.2835 per 1000 lb. of lumber. The entire order of lumber weighs 350,800 lb.

125 - 2 x 4 x 14, Frame lumber .... $
125 - 2 x 4 x 16, " " ....
125 - 2 x 4 x 18, " " ....
100 - 2 x 8 x 10, " " ....
100 - 2 x 8 x 12, " " ....
100 - 2 x 8 x 14, " " .... ____________

Sub-Total $
Discount $____________
Net $
Tax $____________
Sub-Total $
Freight Charge $____________
Total Bill $

12-6 Finding the Cost of Plywood (Price per Sq. Ft.)

Sheets of plywood siding are all 4 ft. wide and 8 ft. long, but the thickness could be $\frac{3''}{8}$, $\frac{1''}{2}$, $\frac{5''}{8}$, or $\frac{3''}{4}$.


4 ft. wide
Thickness varies $\frac{3}{8}$", $\frac{1}{2}$", $\frac{5}{8}$", $\frac{3}{4}$"
8 ft. long

Plywood is priced at "so much per sq. ft." The price of a sq. ft. of plywood increases as the thickness increases. The following price list for plywood shows this.

PLYWOOD SIDING PRICE LIST (All plywood comes in 4' x 8' sheets.)	
Thickness in inches	Price per Sq. Ft.
3/8"	$.095
1/2"	$.135
5/8"	$.225
3/4"	$.365

Example 1: What is the cost of two sheets of 3/8" plywood?

Solution:

a) Since the price is per sq. ft., you must first find how many sq. ft. there are in one sheet.

The Area of one sheet = 4' x 8' = 32 sq. ft.

b) The cost of 3/8" plywood is $.095 per sq. ft.

The cost of two sheets = 2(.095)(32) = $6.08, Answer

Notice that when buying whole sheets of plywood there is always a constant multiplier of 32.

12-6 EXERCISES:

Determine the cost of the following amounts of plywood. Round off answers to nearest cent.

	Number of Sheets	Thickness in Inches	Price per Sq. Ft.	Cost
1.	1	3/8	$	$
2.	2	3/4		
3.	5	5/8		
4.	17	3/8		
5.	8	1/2		
6.	24	3/4		
7.	15	5/8		
8.	35	1/2		
9.	28	3/8		
10.	45	3/4		

Determine the cost of the following lumber orders using a sales tax of 3½%.

11. 8 sheets, 3/8" thick Plywood .... $
10 " , 3/4" " " ....
7 " , 5/8" " " ....
12 " , 1/2" " " .... ____________

Sub-Total $

Tax $____________

Total $

12. Apply successive discounts of 5-15 to this order and an additional 2% discount if the bill is paid within 10 days of receipt.

45 sheets, 3/4" Plywood .... $
65 " , 5/8" " ....
120 " , 1/2" " .... ____________

Sub-Total $
First Discount $____________

First Net $
Second Discount $____________

Second Net $
Tax $____________

Sub-Total $
2% Discount $____________

Final Bill $

13. A lumber company has ordered the following lumber from a wholesaler. Apply a discount of 40% and a freight rate of $.3058 per 1000 lb. of lumber. The entire order weighs 875,500 lbs.

400 sheets, 3/8" Plywood .... $
325 " , 1/2" " ....
380 " , 5/8" " ....
450 " , 3/4" " .... ____________

Sub-Total $
40% Discount $____________

Net $
Tax $____________

Sub-Total $
Freight Charge $____________

Total Bill $

12-7 Other Products Sold by Lumber Companies

Lumber companies sell many other home products besides lumber. The following is a price list of some of these products.

Number of Items	Description of Item	Price	Unit
1	Roll of Tar Paper	$ 2.15	per roll
1	Keg of Roofing Nails	$ 6.60	per keg
1	Keg of #16 Common Nails	$ 10.12	per keg
1	Keg of # 8 " "	$ 9.95	per keg
1	lb. of #6 Finish Nails	$ .05	per lb.
1	Bundle Roof Shingles	$ 2.28	per bundle
1	Bundle Cedar Shingles	$ 2.15	per bundle
1	Medicine Cabinet	$ 16.38	each
1	Window Lock	$ .12	each
1	Cabinet Door Hinge	$ .14	each
1	Interior Door Hinge	$ .39	each
1	5 gallon pail mixed cement	$ 5.27	per pail
1	Interior Mahogany Door	$ 4.56	each
1	Exterior Pine Door	$ 18.50	each
1	Louvered Closet Door	$ 4.42	each
1	Roll of Insulation	$ 3.26	per roll
1	Window	$ 8.46	each
1	Picture Window	$ 53.18	each
1	Garage Door	$125.95	each

12-7 EXERCISE A: Using the preceding price list, determine the cost of the following orders. Sales tax is 3½%.

1. 7 Rolls of Tar Paper .... $
   4 Rolls of Insulation ....
   2 Kegs of Roofing Nails ....
   12 Bundles of Roof Shingles ....
   7 Bundles Cedar Shingles ....
   3 Kegs #8 Common Nails ....
   10 lbs. #6 Finish Nails .... ____________

Sub-Total $

Tax $____________

Total $

2. 8 Interior Mahogany Doors .... $
   6 Louvered Closet Doors ....
   2 Exterior Pine Doors ....
   6 lbs. #6 Finish Nails ....
   2 Pails Mixed Cement .... ____________

Sub-Total $

Tax $____________

Total $

3. 16 Cabinet Door Hinges .... $
   12 Window Locks ....
   1 Medicine Cabinet .... ____________

Sub-Total $

Tax $____________

Total

12-7 EXERCISES B: The problems in this exercise contain the pricing of frame lumber, finish lumber, plywood siding, and other building products for homes. Sales tax is 3½%. Round off answers to nearest cent.

4. The following order is for a recreation room of a home.

56 - 2 x 3 x 8' Frame lumber @ 6¢ per lineal ft.... $
32 - 1 x 3 x 12' Finish lumber @ 2½¢ per lineal ft.
24 sheets 3/8" plywood @ $.095 per sq. ft. ....
½ Keg, #8 common nails ....
8 lb., #6 finish nails ....
2 Interior Mahogany Doors ....
4 Interior Door Hinges .... ____________

Sub-Total $
Tax $____________

Sub-Total $
2% Discount $____________

Final Bill $

5. The following is the framing order for a ranch home that is 45 ft. long and 26 ft. wide.

16 - 2 x 10 x 22 Frame lumber @ $120 per 1000 Bd. ft.$
6 - 2 x 10 x 14 " " " " " " " "
68 - 2 x 8 x 14 " " " " " " " "
9 - 2 x 8 x 16 " " " " " " " "
146 - 2 x 6 x 18 " " " " " " " "
35 - 2 x 4 x 16 " " " " " " " "
18 - 2 x 4 x 12 " " " " " " " "
380 - 2 x 4 x 8 " " " " " " " " ____________

Sub-Total $

Tax $____________

Final Bill$

6. The following is an order for other building products for the home in problem 5.

9 Windows .... $
1 Picture Window ....
2 Exterior Pine Doors ....
11 Interior Mahogany Doors ....
4 Louvered Closet Doors ....
30 Sheets ½" Plywood @ $.135 per sq. ft. ..
6 - 1 x 10 x 14 Finish lumber @ $1.61 each.
12 - 1 x 8 x 12 Finish lumber @ 9¢ per lineal ft.
12 lbs., #6 Finish Nails ....
1 Keg #8 Common Nails ....
1 Garage Door ....
20 Rolls of Insulation .... ________

Sub-Total $
Tax $________
Sub-Total $
2% Discount $________
Final Bill $

12-8 Installation of Glass and Related Aluminum Products

In this section you will be introduced to problems involving the installation of glass and aluminum products by a glass company.

The State Glass Co. installs window glass in all types of buildings - schools, private homes, factories, grocery stores, department stores, churches, etc. Besides windows the company also installs aluminum doors that have glass. The prices that the company charges for installing glass products will be found in the following table. Note that there are different kinds of glass - regular window glass in various thicknesses, polished wire glass for doors that need extra strength, and mirrors with or without stainless steel edges. Glass comes in many different sizes.

The aluminum window casing and angle frames listed in the table are used to hold the glass in place. An aluminum threshold is what is fastened to the floor underneath aluminum doors. It provides a weatherproof seal against rain, snow, or wind.

You will notice that glass products are priced in different ways - glass is priced at "so much per sq. ft." (but glass dimensions are given in inches). Aluminum casing and angle frame are priced "per lineal ft." All of the prices include the the cost of labor.

PRICE LIST FOR GLASS AND ALUMINUM PRODUCTS

GLASS PRODUCTS

Description	Thickness	Price
Window Glass	1/16"	$ .90 per sq. ft.
" "	3/32"	.95 " " "
" "	1/8"	1.00 " " "
" "	5/32"	1.05 " " "
" "	3/16"	1.10 " " "
" "	7/32"	1.15 " " "
Polished Plate Glass Window		$1.30 per sq. ft.
Polished Wire Glass Window		$2.50 " " "
Mirrors with stainless steel edges .		$6.00 " " "
Mirrors without stainless steel edges		$3.00 " " "

ALUMINUM PRODUCTS

3' x 7' Aluminum Door with Hardware	$130.00 each
Aluminum Threshold for Door	$ 1.50 per lineal ft.
Aluminum Window Casing	$ 3.00 " " "
Aluminum Angle Frame, No. 1	$ 2.00 " " "
Aluminum Angle Frame, No. 2	$ 2.35 " " "
Aluminum Angle Frame, No. 3	$ 4.50 " " "

Example 1: What is the cost of installing 12 pieces of 3/16" thick window glass **if** each piece is 20" x 48"?

Solution: Since the price is $1.10 per sq. ft. (found from the table) you must first find how many sq. ft. of glass you have.

a) One square foot contains 144 sq. inches. One piece of glass is 20" x 48". Its area is therefore 20 x 48 = 960 sq. in. Change this to sq. ft. by dividing by 144:

$\frac{960}{144} = 6.667$ (3 decimal places needed.)

b) You can now find the cost of 12 pieces of glass:

Cost = 12 x **6.667** x $1.10 = $88.00

You can also do the problem by combining all of the factors involved: $\text{Cost} = \frac{12 \times 20 \times 48 \times \$1.10}{144} = \frac{12672.0000}{144} = \$88.00$

(Add at least two extra zeros to the numerator.)

12-8 EXERCISES: Determine the cost of the following glass and aluminum installations. State sales tax is 3½%. All window dimensions are expressed in inches except where noted.

1. 14 pcs., 22" x 30", 5/32" window glass .... $ 67.38
   16 pcs., 20" x 14", 1/16" " " ....
   1 pc., 60" x 72", Polished plate glass .....
   22 ft. No. 1 Aluminum Angle Frame ....
   22 ft. Aluminum Window Casing .... ________

Sub-Total $

Tax $________

Total $

FILMED FROM BEST AVAILABLE COPY

2. A grocery store owner has decided to change his store front. Determine the cost of removing the old front and installing the new one. Labor for removing the old store front is $350. Sales tax is 3½%.

1 - 3' x 7' Aluminum Door with hardware $
110 ft. Aluminum Window Casing
16 ft. No. 2 Angle Frame
3½ ft. Threshold
1 - 32 x 78 Polished Plate Glass
2 - 30 x 84 " " "
2 - 30 x 12 " " "
1 - 36 x 32 " " "
2 - 42 x 80 " " "
2 - 44 x 80 " " "
____
$

3. This is an order to install window glass in a convalescent hospital that is under construction.

Description of Glass: 3/16" thick
14 - 20 x 48 .... $
14 - 22 x 30 ....
14 - 22 x 42 ....
3 - 46 x 48 ....
12 - 22 x 64 ....
12 - 20 x 14 .... __________

First Sub-Total $

(#3 continued on next page)

Description of Glass: 7/32" thick

3 - 8 x 36 .... $

2 - 10 x 32 .... $

5 - 12 x 42 .... $__________

Second Sub-Total $

Description of Glass: 5/32"

16 - 8 x 36 .... $

20 - 10 x 10 .... $

1 - 76 x 24 .... $

1 - 42 x 48 .... $

6 - 24 x [illegible] .... $

5 - 20 x 72 .... $__________

Third Sub-Total $

First Sub-Total $

Second " " $

Third " " $__________

Final Cost $

4. Determine the cost of installing the following:

2 - 120 x 96 polished plate glass .... $

1 - 36 x 72 " " " ....

2 - 60 x 72 mirrors without stainless steel edges ....

150 ft. window casing ....

75 ft. No. 3 Angle Frame ....

8 - 20 x 20 3/32" window glass ....

4 - 36 x 18, 3/16" " " .... __________

Sub-Total $

Tax $__________

Total

5. G. Fox & Co. wants to install additional display cases in its jewelry department. There will be three cases, each having a glass top that measures 8 ft. long and 3 ft. wide. The front of each case will also be glass for its entire length. The cases are 42" high. The glass is to be polished plate, extra strong, at a price of $2.75 per sq. ft. Determine the cost of installing the glass. Include a sales tax of 3½%.

6. Two display windows of a department store were broken. Each window is 7 ft. wide and 8 ft. high. The windows will be polished plate glass. The labor charge for removing the broken windows is $20.50. Determine the cost of replacing the windows. State sales tax is 3½%.

7. A special aquarium is to be installed in a museum. It will be a rectangular solid with an open top. Its dimensions are 12 ft. long, 8 ft. wide, and 4 ft. high. The glass sides and bottom are thermopane, costing $3.85 per sq. ft. Special waterproof casing will be installed along all edges except the top. The price of this casing is $4.75 per lineal ft. Determine the price of the aquarium. Sales tax is 3½%.

12-9 Shipment and Billing of Fractional Parts of an Order

Besides being able to make out invoices, clerks must be able to understand and use fractions in their work.

The following is a typical problem that a clerk must solve when working for an industrial wholesaler.

The wholesaler is Capitol Light and Supply Co. Capitol Light supplies lighting equipment, wire, and light fixtures to electrical contractors. These contractors install complete wiring systems for homes, schools, factories, apartment houses, etc.

A contractor, H.T. Wilson Co., has bought **his** supplies from Capitol Light, but does not want all of the supplies delivered to the job site at one time. **He** wants only fractional parts of the order to be delivered. These supplies will be loaded onto a truck on a weekly schedule. It is the clerk's job to load the correct fractional parts according to this weekly schedule and to then complete the invoicing and billing.

The following is the list of supplies that the contractor has purchased from Capitol Light and Supply Co. The supply list shows a code number which identifies each item that has been ordered. The list also gives a description of each item and its list price.

Supply List for Job

Amount Ordered for Job	Description of Items	Code No. of Item	Unit Price (each)
350	Type A Flourescent Lights	100	$ 37.25
22	Exterior Spot Lights	101	12.95
75	Light Switches, SPST	102	1.79
225	Wall Outlets, Duplex	103	2.16
64	Office Fixtures	104	8.37
16	8" Exhaust Fans	105	15.00
30	Basement Fixtures	106	3.79
4	Reels #18 Electric Cable	107	250.00
6	Rolls ½" Bx. Cable	108	6.19
20	#8 Pull Boxes	109	3.78
16	#4 Pull Boxes	110	2.90
8	#16 Fuse Boxes	111	43.25
24	#20 Fuse Boxes	112	63.75
800 pcs.	3/4" Conduit	113	2.58
500 pcs.	1" Conduit	114	3.37
240 pcs.	2" Conduit	115	4.93
24 boxes	3/4" Clips	116	2.09
12 boxes	1" Clips	117	2.95
200	4" Roughing Boxes	118	1.67

Complete the following invoices. The contractor is given a 42% discount and an additional 1½% discount if he pays his bill within 10 days of receipt. State sales tax is 3½%.

12-9 EXERCISES

CAPITOL LIGHT & SUPPLY CO.

Week Number: 1 Sold To: H. F. Wilson Co.

Date Shipped: 06 03 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
113	1/20	1/20 x 800 = 40	$ 2.58	$
114	1/50			
115	1/24			
116	1/10			

Sub-Total $

Discount $

Sub-Total $

Sales Tax $

1½% Discount $

Net Amount $

CAPITOL LIGHT & SUPPLY CO.

Week Number: 2 Sold To: H. P. Wilson Co.

Date Shipped: 06 20 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
116	1/3			$
117	1/6			
118	1/5			
107	1/4			
108	2/3			

Sub-Total	$
Discount	$
Sub-Total	$
Sales Tax	$
1½% Discount	$
Net Amount	$

CAPITOL LIGHT & SUPPLY CO.

Week Number: 3 Sold To: H. P. Wilson Co.

Date Shipped: 06 27 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
109	1/2			$
110	1/2			
111	1/4			
112	1/3			

Sub-Total $

Discount $

Sub-Total $

Sales Tax $

1½% Discount $

Net Amount $

CAPITOL LIGHT & SUPPLY CO.

Week Number: 4 Sold To: H. P. Wilson Co.

Date Shipped: 07 04 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
113	7/10			$
114	3/4			
115	7/8			
118	7/10			
			Sub-Total	$
			Discount	$
			Sub-Total	$
			Sales Tax	$
			1½% Discount	$
			Net Amount	$

CAPITOL LIGHT & SUPPLY CO.

Week Number: 5 Sold To: H. F. Wilson Co.

Date Shipped: 07 11 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
100	1/7			$
101	1/11			
102	1/5			
104	3/8			
105	1/4			
106	5/6			

Sub-Total	$
Discount	$
Sub-Total	$
Sales Tax	$
1% Discount	$
Net Amount	$

CAPITOL LIGHT AND SUPPLY CO.

Week Number: 6 Sold To: H. P. Wilson Co.

Date Shipped: 07 18 67 Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
100	6/7			$
101	9/11			
102	3/5			
103	3/5			
104	5/8			

Sub-Total	$
Discount	$
Sub-Total	$
Sales Tax	$
1½% Discount	$
Net Amount	$

CAPITOL LIGHT & SUPPLY CO.

Week Number: 7 | Sold To: H. F. Wilson Co.

Date Shipped: 07 25 67 | Job: Windsor Elem. Sch.

Code No.	Fractional Part of Order	Amount Loaded on Truck	Unit Price (each)	Extension
107	3/4			$
108	1/3			
109	1/2			
110	1/2			
111	3/4			
112	2/3			

Sub-Total	$
Discount	$
Sub-Total	$
Sales Tax	$
1½% Discount	$
Net Amount	$

12-10 Computing The Cost of Steel Chain

The following table shows list prices of chains manufactured by Whitney Chain Co. Using the information shown, complete the invoices that follow the table. Sales tax is 3½%. Discounts are indicated in each invoice.

Code No.	Sold Only in Lengths of	Price Per Lineal Ft.
18073	10 feet	$9.58
18083	10 "	6.80
18093	10 "	5.41
18103	10 "	4.73
00746	5 "	1.46
00749	20 "	1.60
00752	35 "	1.72
80329	25 "	.952
80297	50 "	.905
80130	100 "	.705
28410	75 "	20.01
28510	50 "	18.38
28610	25 "	15.92

12-10 EXERCISES:

Invoice No. 1

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
80297	5	5(50)=250	$ .905	$226.25
18083	7			
28510	20			
			Sub-Total	$
			39½% Discount	$
			Sub-Total	$
			Tax	$
			Final Bill	$

Invoice No. 2

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
80130	10			$
80297	5			
18073	100			
28410	6			
			Sub-Total	$
			40.6% Discount	$
			Sub-Total	$
			Tax	$
			Final Bill	$

Invoice No. 3

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
00746	20			$
28610	17			
18093	12			
00749	5			
80329	13			
			Sub-Total	$
			45.3% Discount	$
			Sub-Total	$
			Tax	$
			Final Bill	$

Invoice No. 4

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
00752	10			$
80297	20			
18083	20			
80329	16			
00749	50			
23410	4			
			Sub-Total	$
			32½% Discount	$
			Sub-Total	$
			Tax	$
			Final Bill	$

12-11 Yearly State Tax Collections

STATE OF CONNECTICUT
TAX DEPARTMENT
92 FARMINGTON AVENUE • HARTFORD, CONNECTICUT 06115

The Connecticut State Tax Dept. collects very large sums of money. You may have seen newspaper articles that list the amounts of money collected by the tax department. The tax department collects this money from twenty one different sources.

The following is a "simple" addition problem that shows the various sources of tax and the amount of tax collected from each source. The sum of these taxes is the amount collected from June of 1965 to June of 1966.

Find the total amount of taxes collected for the fiscal year, 1965 - 1966.

Source	Amount of Tax
Amusement	$ 93,320.25
Beverage - Alcoholic	16,863,308.60
Car Companies	25,447.38
Cigarette Tax	31,827,408.32
Conn. Estate Tax	410,293.96
Corporation Business Tax	67,958,858.50
Electric & Power Cos.	2,624,359.88
Express Companies	7,500.00
Gas Companies	1,619,551.60
Gas and Electric Cos.	7,689,747.17
Inheritance Tax	39,583,984.95
Insurance Companies	10,523,060.78
Motor Carrier Road Tax	1,107,967.30
Motor Fuel Tax	60,773,937.77
Railroads	25,397.52
Steam Companies	97,329.43
Telegraph & CableCos.	66,545.96
Telephone Cos.	11,759,870.15
Unincorporated Business Tax	3,525,741.81
Water and Water Power Cos.	966,746.83
State Sales Tax	99,667,919.38
Total Taxes for one year	$

12-12 Comparing Monthly State Tax Collections

The Conn. State Tax Dept. often compares how much tax was collected for the same month of two different years. This comparison shows whether it collected more taxes or less taxes. It reports the difference as an increase or a decrease. If more tax was collected it indicates this by a plus (+) sign. If less tax was collected, the decrease is indicated by a minus(-) sign.

Consider the following example:

Source	May, 1965	May, 1966	Increase (+) Decrease (-)
Amusement Tax	$ 8,300.00	$ 7,900.00	$ 400.00 -
Car Company tax	140.00	50.00	$
Gasoline Tax	4,800,000.00	4,820,000.00	$
		Total Increase or Decrease	$

a) Did Amusement Tax increase or decrease and by how much?

Answer: From $8,300.00 to $7,900.00 is a decrease of $400.00

Therefore, write $400.00 -

b) Did Car Company Tax increase or decrease and by how much?

Answer: From $140.00 to $50.00 is a decrease of $90.00.

Therefore, write $90.00 -

c) Find the increase or decrease for Gasoline Tax and write the difference with its proper sign.

d) What was the total increase or decrease for the three tax sources?

$ 400.00 -
90.00 -
← *Gasoline tax increase or decrease.*

Total Increase or Decrease } $19,510.00 + You should get this answer.

Write the answer opposite Total Increase or Decrease, and be sure to write the + sign. Your answer is not correct without the + sign.

12-12 EXERCISE A: Determine the total increase or decrease of the following monthly tax comparisons. Every answer should be followed by a + or - sign unless the difference is zero.

1.

Source	April, 1964	April, 1965	Increase (+) Decrease (-)
Conn. Estate Tax	320,000.00	33,000.00	$
Electric & Power Cos.	220,000.00	231,000.00	$
Railroads	2,300.00	1,700.00	$________
	Total Increase or Decrease		$

2.

Source	Nov. 1965	Nov. 1966	Increase (+) Decrease (-)
Corp. Business Tax	1,250,000.00	1,506,000.00	$
Gas Companies	145,000.00	130,000.00	$
Unincorp. Bus. Tax	341,000.00	100,000.00	$________
	Total Increase or Decrease		$

3.

Source	Jan. 1964	Jan. 1965	Increase (+) Decrease (-)
State Sales Tax	26,019,340.26	27,210,125.59	$
Inheritance Tax	1,437,000.00	1,437,000.00	$
Cigarette Tax	2,702,080.80	2,002,911.56	$________
	Total Increase or Decrease		$

4.

Source	Oct. 1960	Oct. 1961	Increase (+) Decrease (-)
Motor Carrier Road Tax	79,498.32	108,045.54	$
Telephone Cos.	980,162.29	98,943.22	$
Insurance Cos.	782,443.21	78,244.32	$________
	Total Increase or Decrease		$

There is a special feature of your machine which enables you to find the increase or decrease from one number to another. This special feature is called Credit Addition.

Up to this point whenever you have subtracted one number from another you have always entered the larger number first and the smaller number second in your machine. This is not necessary in credit addition. Consider the following example:

Example 1: Find the increase or decrease in taxes collected in June of 1966 and June of 1967.

June 1966	June 1967	Increase (+) Decrease (-)
$5,000	$3,000	$

Solution:

a) Enter the 1967 amount of $3,000 first and press the Add Key.

b) Enter the 1966 amount of $5,000 and press the Subtraction Key.

c) Press the Total Key.

d) The answer is $2,000 cT. The letter "c" indicates a minus (-) sign. You should write your answer as $2000 -.

SUMMARY:

Always enter the tax for the present year first, and the tax for the past year second. If the answer has the letter "c" it means a decrease (-). If the answer does not have the letter "c" it means an increase (+).

12-12 EXERCISE 3: Determine the total increase or decrease of the following monthly tax comparisons.

1. Source	March, 1964	March, 1965	Increase or Decrease
Conn. Estate Tax	$329,000.00	$322,000.00	$
Amusement Tax	8,890.00	8,170.00	
Steam Companies	9,430.00	10,800.00	________
		Total Increase or Decrease	$

2. Source	May 1965	May 1966	Increase or Decrease
Beverage-Alcoholic	$1,266,273.47	$1,268,288.31	$
Car Companies	1,097.24	209.75	
Express Cos.	26,147.08	2,614.78	
Railroads	2,336.56	1,780.22	
Water Power Cos.	781.19	88.35	
Gas Companies	145,007.29	154 070.92	________
		Total Increase or Decrease	$

3. Source	July 1966	July 1965	Increase or Decrease
State Sales Tax	$23,430,846.22	$26,099,843.20	$
Cigarette Tax	2,672,030.98	2,730,911.15	
Gasoline Tax	5,602,230.57	4,559,352.76	
		Total Increase or Decrease	$ ________

12-13 Unincorporated Business Tax

In this section you will find how the yearly tax is determined for unincorporated businesses.

Unincorporated businesses are divided into two categories for tax purposes:

1) Retailers, wholesalers, and manufacturers.
2) Motor transportation, and amusement.

A) Retailers, wholesalers, and manufacturers sell goods. The amount of money that these businesses get from the sale of their goods is taxed at a certain rate. The rate of tax on their sales is:

$1.30 per thousand up to and including $60,000 and
$2.60 for every thousand over $60,000.

Example 1: Determine the tax for a retailer whose sales were $72,800.

Solution:

a) The first $60,000 is taxed at a rate of $1.30 per thousand. $1.30(60) = $78.00

b) Every $1000 worth of sales over $60,000 is taxed at $2.60 per thousand.

72,800 - 60,000 = 12,800

$\frac{12,800}{1000}$ = 12.8 thousands

$2.60(12.8) = $33.28

c) The total tax is:

$$\begin{array}{r} \$78.00 \\ \underline{33.28} \\ \$111.28 \end{array}$$

Answer

B) Unincorporated motor transportation and amusement businesses derive their income from sales and services. The rate of tax on their income is:

$.35 per thousand up to and including $60,000 and
$.65 for every thousand over $60,000.

Example 2: Determine the tax for a motor transportation business whose income was $843,900.

Solution:

a) The first $60,000 is taxed at a rate of $.35 per thousand. $.35(60) = $21.00

b) Every $1000 of income over $60,000 is taxed at $.65 per thousand.

$843,900 - 60,000 = $783,900

$\frac{783,900}{1000} = 783.9$ (Do not round off.)

$.65(783.9) = $509.54

c) The total tax is:

```
$ 21.00
 509.54
$530.54  Answer
```

Example 3: Determine the tax on an amusement business if income was $53,400.

Solution: Income was not over $60,000, therefore the tax will be $.35(53.4) = $18.69 Answer

12-13 EXERCISES: Determine the yearly tax for the following unincorporated businesses.

1. A wholesaler's sales were $84,900. Compute the tax.

2. The Rand Company manufactures space suits. Sales were $2,470,000 for the year. Compute the tax.

3. The Trailways Bus Co. had income of $609,700. Compute the tax.

4. The Berlin Turnpike theater had income of $53,400. Compute the tax.

5. A retailer's sales were $908,700. Compute the tax.

6. The Precision Products Co. manufactures pumps. If sales were $1,709,000, compute the tax.

7. The 1966 income for an amusement park was $590,000. In 1967, income was 125% of the 1966 income. Compute the tax for 1967.

8. Sales for a retailer were $60,500. Compute the tax.

9. Sales for 1965 for a wholesaler were $608,000. In 1966, sales were 115% of the 1965 sales. Compute the tax for 1966.

10. A retailer had the following monthly sales. Compute his tax for the year.

Jan.	$ 6,750	July	$21,743
Feb.	8,495	Aug.	19,889
Mar.	5,087	Sept.	15,065
Apr.	12,640	Oct.	17,320
May	15,088	Nov.	21,674
June	13,709	Dec.	28,040

12-14 Reading an Electric Watt - Hour Meter

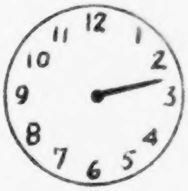
An electric watt-hour meter is an instrument for measuring the amount of electricity used by electrical equipment. Just as the mileage indicator in a car adds up the miles that the car has been driven, the watt-hour meter adds up the amount of electricity that has been used by electrical equipment.

Electric meters are read each month at about 30 day intervals. If the reading is taken on June 9, for instance, then the next reading would be taken on July 9. The previous month's reading is subtracted from the present month's reading. The difference is the amount of electricity used. The units of electricity are kilo watt hours (KWH).

To find how much the electricity costs, you will use a rate table which indicates how to price the electricity.

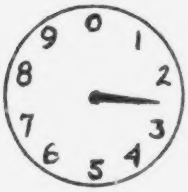
First, let us begin by reading the dials on an electric watt-hour meter.

Reading the dials on a watt-hour meter is something like reading a clock. The only difference is that on a clock there are two hands and on a watt-hour meter there is only one hand on a dial. The following picture shows a clock with only the hour hand shown:



How many hours has the hour hand moved from 12 o'clock? Answer: It has moved 2 hours.

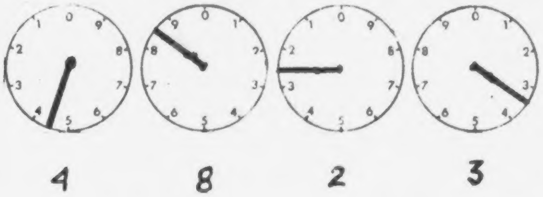
The following is a picture of one dial on a watt hour meter:



How many kilo watt hours has the hand moved from zero? Answer: It has moved 2 kilo watt hours. It has not moved 3 yet.

An electric watt hour meter has four dials on it. Each dial is read separately, beginning with the left dial.

Example 1: Read this electric watt-hour meter.



Notice that the numbers on two dials **go** clock-wise and on the other two the numbers go counter-clockwise.

The meter reading is 4, 8 2 3 KWH (kilo watt hours).

For 4,000, the hand is between 4 and 5, so you read 4.

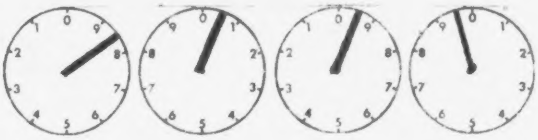
For 800, the hand is between 8 and 9, so you read 8.

For 20, the hand is between 2 and 3, so you read 2.

For 3, the hand is between 3 and 4, so you read 3.

Notice that in reading each dial you choose the number that the hand has passed completely.

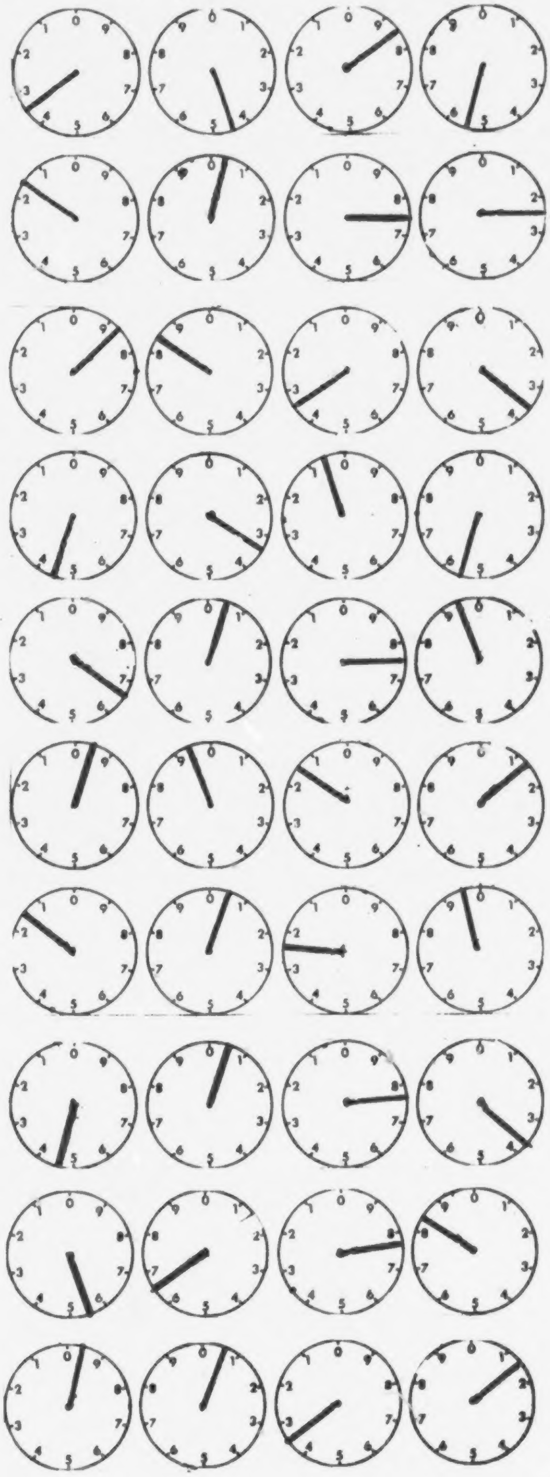
Example 2: Read this watt-hour meter.



The meter reading is ________ KWH.

12-14 EXERCISE: Read these meters and write your answers where indicated.

Answers



0
1
2
3
4
5
6
7
8
9

______

______

______

______

______

______

______

______

______

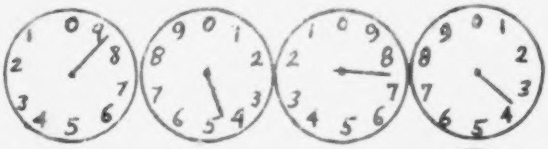
______

12-15 Find the Difference Between Two Meter Readings

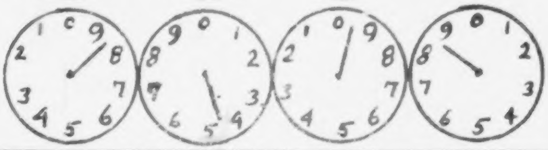
Read the following meters and determine how many kilo watt hours of electricity have been used from the beginning of the month to the end of the month.

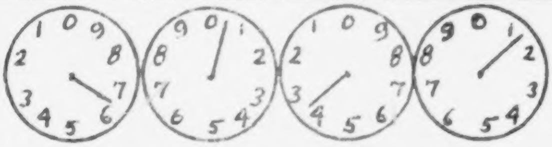
12-15 EXERCISES

Readings KWH Used

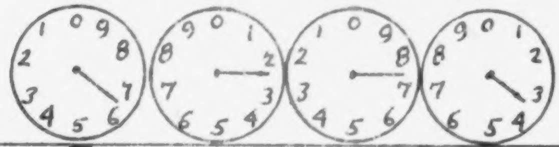
Jan 1

______

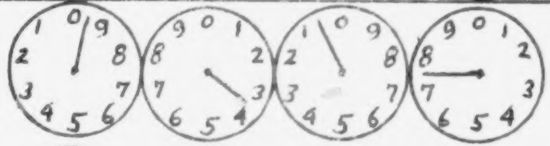
1) ______

Jan 31

______

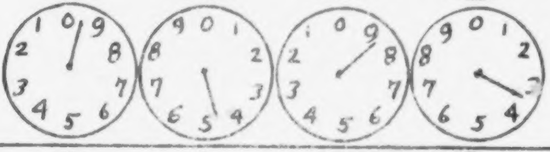
Apr 2

______

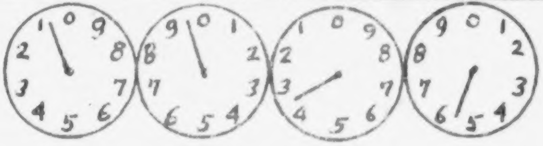
2) ______

May 2

______

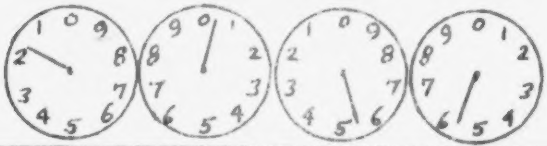
Nov 1

______

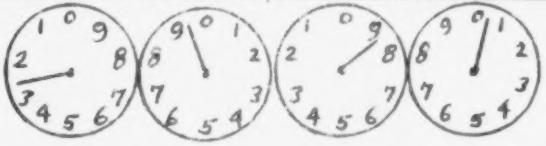
3) ______

Nov 30

______

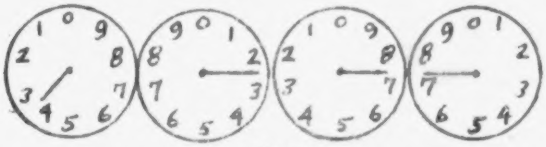
Mar 5

______

4) ______

Apr 5

______

June 2

______

5) ______

July 2

______

12-16 Finding the Cost of Electricity

To find the cost of electricity we must use a rate table which shows us how to price the number of KWH used for a month.

The following is the rate schedule used for residential customers (private homes):

THE HARTFORD ELECTRIC LIGHT COMPANY

Effective January 1, 1962 **Rate 1**
Revised July 1, 1964

RESIDENTIAL SERVICE ELECTRIC

APPLIES in all towns served by the Company.

AVAILABLE to residential customers for standard single-phase service for residential uses (including incidental farm uses on the same meter) in a single dwelling unit where distribution facilities are suitable for the service requested.

SCHEDULE OF MONTHLY CHARGES:

		Per Kwh
First	20 Kwh	8.25¢
Next	80 Kwh	3.5 ¢
Next	100 Kwh	2.7 ¢
All Over	200 Kwh	2.2 ¢

Example 1: Determine the cost of using 260 KWH of electricity.

Solution: We must price 260 KWH in steps:

a) The first 20 KWH costs 8.25¢ per KWH:
20($.0825) = $1.65

b) The next 80 KWH costs 3.5¢ per KWH:
80($.035) = $2.80

c) The next 100 KWH costs 2.7¢ per KWH:
100($.027) = $2.70

d) So far we have priced 20 + 80 + 100 = 200 KWH.
We have 260-200 = 60 KWH more to price.

e) The remaining 60 KWH costs 2.2¢ per KWH:
60($.022) = $1.32

f) The *total* cost of using 260 KWH is:

$1.65
2.80
2.70
1.32
$8.47 Answer

Example 2: Determine the cost of using 175 KWH of electricity.

Solution: Before we begin, will we use every one of the four steps in the rate table? Answer: No - using all four steps means that we would have more than 200 KWH to price. So we will only use the first *three* steps.

Step 1: The first *20* KWH costs 20($.0825)= *$1.65*

Step 2: The next *80* KWH costs 80($.035) = *$2.80*

Step 3: We have priced 20 + 80 = 100 KWH so far. We have to price 175 KWH altogether, so we have 175-100 = 75 KWH more to price.

This 75 KWH costs 75($.027) = $2.025 = *$2.03*

The total cost of using 175 KWH is:

$1.65
2.80
2.03
$6.48 Answer

12-16 EXERCISES: Determine the monthly electric bill for the following residential customers.

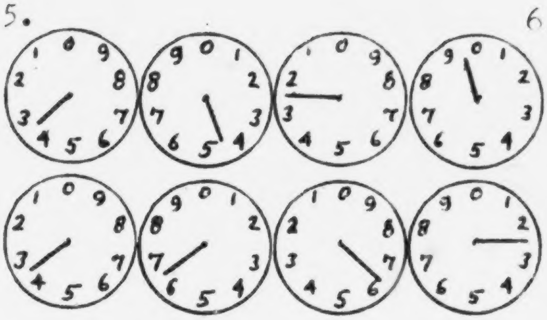
1. KWH used is 240.

2. KWH used is 180.

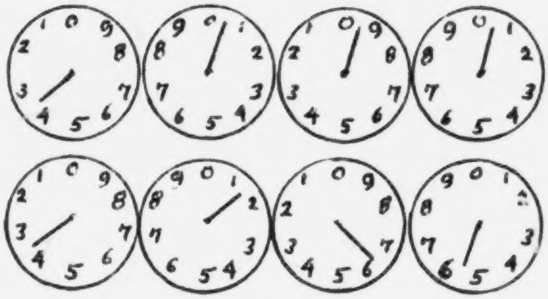
3. KWH used is 100.

4. KWH used is 67.

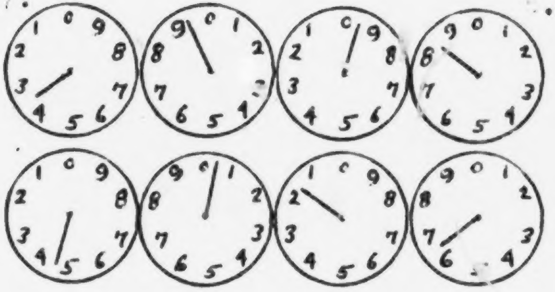
5.



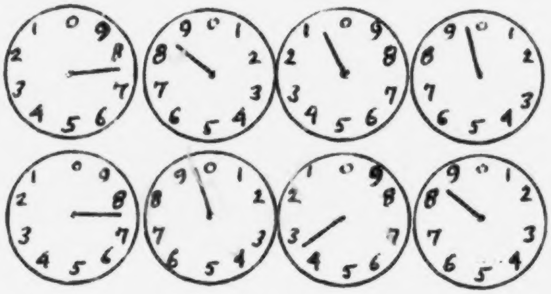
6.



7.



8.



9. The meter reading on June 7 was 7041 and on July 7 was 7307. Determine the customer's bill.

10. If the meter reading on Aug. 2 was 5073 and 5308 on Sept. 2, compute the customer's bill.

11. Two successive meter readings for a residential customer were 8047 and 8212. Compute his bill.

12. Two successive meter readings were 6307 and 6392. Compute the bill.

13. A customer went on vacation. His meter readings were 4172 and 4188. Compute his bill.

14. If the meter readings are 7935 and 8250, compute the electric bill.

12-17 Computing Electric Bills By Using Formulas

To make the employees' work easier and shorter, billing formulas are used to determine the customer's monthly bill.

The following are the billing formulas used:

If KWH is		The billing formula to be used is:
At least	But not more than	
0	22	Bill=$1.75
23	100	Bill=$.035(KWH) + $.95
101	200	Bill=$.027 (KWH) + $1.75
201 or more		Bill=$.022(KWH) + $2.75

Notice that if 22 KWH (or less) is used, there is no formula - the customer is charged a flat rate of $1.75.

Example 1: Using the correct billing formula, compute the electric bill for using 183 KWH.

Solution: 183 KWH is between 101 and 200 KWH. Therefore, the formula $.027 (KWH) + $1.75 will be used.

Bill = $.027 (KWH) + $1.75

= .027(183) + 1.75

Bill = 4.94 + 1.75 = $6.69 Answer

12-17 EXERCISES: Using the billing formulas, compute the bills for the following customers.

1. KWH is 37 2. KWH is 16

3. KWH is 116

4. KWH is 24

5. KWH is 200

6. KWH is 100

7. KWH is 10

8. KWH is 291

9. KWH is 210

10. KWH is 150

11. KWH is 199

12. KWH is 99

13. KWH is 0

14. KWK is 350

12-18 Analysis of Rate Reduction

The Hartford Electric Light Co. recently reduced their rates because of greater efficiency in producing electricity. This was made possible by installing more modern equipment. The savings are passed on to the customers in the form of lower rates - which means lower electric bills.

In the following rate analysis, determine the amount of decrease and the per cent decrease based on the old rate. Per cents should be written to the nearest tenth.

12-18 EXERCISE 4:

KWH Used Per Month	Old Rate	New Rate	Amount of Decrease	Per Cent Decrease
200	$ 7.15	$ 7.11	$.04	.6%
250	8.35	8.25		
300	9.55	9.35		
350	10.75	10.45		
400	11.95	11.55		
450	13.15	12.65		
500	14.35	13.75		
600	16.55	15.95		
700	18.75	18.15		
800	20.95	20.35		
900	23.15	22.55		
1000	25.35	24.75		

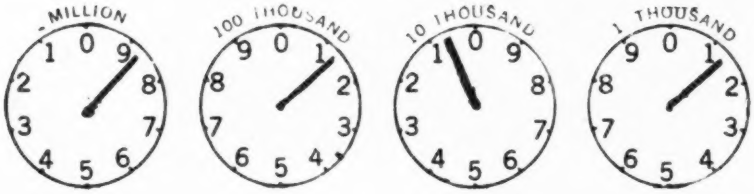
12-18 EXERCISE B: The Hartford Electric Light Co. is considering lowering their rates after the installation of a new atomic-powered generating station. The following table shows the present rates and the per cent decrease. Determine the amount of decrease and the new rates.

KWH Used Per Month	Old Rate	Per Cent Decrease	Amount of Decrease (Near. cent)	New Rate
200	$ 7.11	.3%	$	$
250	8.25	.6		
300	9.35	1.0		
350	10.45	1.4		
400	11.55	1.9		
450	12.65	2.4		
500	13.75	3.0		
600	15.95	3.6		
700	18.15	4.0		
800	20.35	4.3		
900	22.55	4.6		
1000	24.75	4.8		

12-19 Computing Gas Bills

A gas meter is a device for measuring the number of cubic feet of gas used in a given period of time.

The dials of the meter are read in the same manner as electric watt-hour meter dials. However, after the numbers on the dials have been read, two zeros must be added after the last digit.


MILLION
100 THOUSAND
10 THOUSAND
1 THOUSAND
1 0 9 8 7 6 5 4 3 2
9 0 1 2 3 4 5 6 7 8
1 0 9 8 7 6 5 4 3 2
9 0 1 2 3 4 5 6 7 8

The reading of the above gas meter is 810100. You will have to remember that when reading gas meters, two zeros must be written after the last digit of the dial reading.

The units of gas meter readings are cubic feet (cf). The above meter reading would be 810,000 cf.

The following rate schedule is used to determine gas bills.

GAS RATE SCHEDULE

First 200 cf or less	$1.78
Next 1000 cf	.0024 per cf
Next 2400 cf	.00205 per cf
All over 3600 cf	.0019 per cf

(What is another way of writing:)

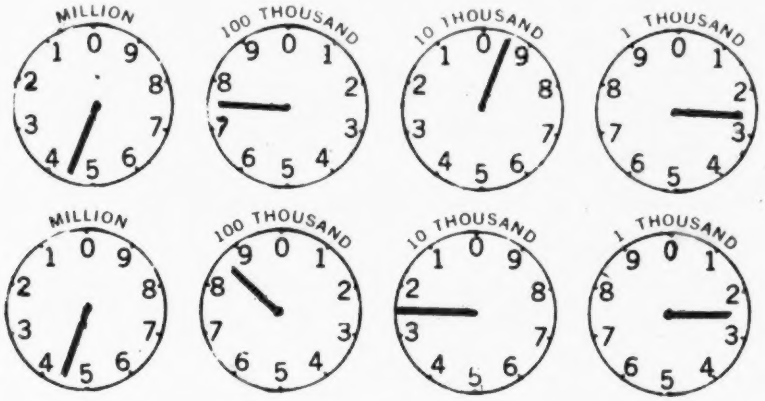
$.0024 - - - - -

$.00205 - - - - - -

$.0019 - - - - - -

12-19 EXERCISES: Compute the following gas bills.

1.


MILLION
100 THOUSAND
10 THOUSAND
1 THOUSAND
MILLION
100 THOUSAND
10 THOUSAND
1 THOUSAND

2. On July 1 the dials of a gas meter read 6039. On August 1 the dials read 6057. Compute the gas bill.

3. Two successive dial readings of a gas meter were 2607 and 2615. Compute the gas bill.

4. During one month, 100 cf of gas was used. What is the gas bill?

5. During a month 2900 cf of gas was used. Compute the gas bill.

6. A bakery uses gas for its ovens. Two successive dial readings for a month were 7427 and 7472. Compute the gas bill.

7. The dials on a gas meter read 2698 on Oct. 1. During October, 3800 cf of gas was used. What would the dials read on Oct. 31? Compute the bill.

8. During a month, 2300 cf of gas was used. What would the dials read at the end of the month if the dials read 4792 at the beginning of the month? Compute the bill.

9. The dial reading on a gas meter was 9250 at the end of September. What did the dials read on Sept. 1 if 1700 cf of gas was used? Compute the bill.

10. At the end of July the dials of a gas meter read 7005. During July, 4100 cf of gas was used. What was the dial reading at the beginning of July? Compute the bill.

11. The following are the meter readings taken each month from a gas meter for a private home. Determine each monthly gas bill and the total cost of gas for the heating season. The Sept. 1 dial reading was 5132.

	Dial Reading	Gas Used (cf)	Cost
Oct. 1	5154	2200 cf	$ 6.23
Nov. 1	5179		
Dec. 1	5208		
Jan. 1	5244		
Feb. 1	5284		
Mar. 1	5322		
Apr. 1	5348		
		Total	$

12-20 Computing Fuel Oil Bills

Fuel oil is used for heating any building that is occupied by people. It is also used to heat ovens in industrial plants - ovens for the drying of lumber, melting of metals or the boil-of chemicals.

There are different grades of fuel oil. Fuel oil used for heating homes is called No. 2 oil and is very light - something like kerosene. No. 4 oil is a little heavier and is used to heat schools. No. 6 oil is very thick - almost as thick as melted tar - and is used in industrial furnaces. (In fact, because No. 6 oil is so thick, it has to be thinned by heating it. It has to be thinned so that it can be pumped into the oil burner of a furnace and there ignited into flame.)

The following is a price list for fuel oil.

FUEL OIL PRICE LIST		
Grade	Used In	Price Per Gallon
No. 2	Homes	16.8¢
No. 4	Schools	7.7¢
No. 6	Industry	3.9¢

12-20 EXERCISES: Using the fuel oil price list, determine the cost of fuel oil in the following problems. Round off to nearest cent.

1. A fuel oil truck has pumped 243 gallons of oil into a homeowner's basement tank. Determine the fuel bill.

2. During one heating season (from Sept. to June) Wethersfield High School used 119,704 gallons of oil. Determine the cost of fuel for the heating season.

3. During the heating season, 1625 gallons of fuel were used to heat a home. What is the cost of heating the home?

4. An industrial firm used **2,483** gallons of oil to heat its ovens. What was their fuel bill?

5. The following amounts of fuel oil were delivered to a home for a heating season. Compute each monthly bill and the season's bill.

Month	Gallons	Cost	
Sept.	149	$	
Oct.	187	$	
Nov.	244	$	
Dec.	322	$	
Jan.	355	$	
Feb.	337	$	
Mar.	240	$	
Apr.	193	$______	
		$	Total Bill

6. The three high schools in Hartford used the following amounts of fuel oil during the past heating season. Determine the heating bill for each school and the season's bill for all three schools.

School	Gallons	Cost	
Hartford Public HS	223,540	$	
Weaver HS	138,078	$	
Bulkeley HS	132,409	$________	
		$	Total Bill

7. Pratt & Whitney Aircraft used 2,840,000 gallons of No. 6 oil and 72,460 gallons of No. 4 oil during one year. Determine the cost of each grade of fuel oil and the total cost.

8. The average single family home uses about 1600 gals. of fuel oil per year. Recently the price of oil went up .5¢ per gallon. How much more will a home owner's fuel bill be per year?

9. The price of No. 6 fuel oil has recently been decreased by .2¢. If an industrial firm uses 98,450 gallons of oil per year, how much less will the yearly fuel bill be?

12-21 Review Exercises

Using the price lists for frame and finish lumber, determine how much the following would cost. Round off to nearest cent.

	Number of Pieces	Kind of Lumber	Size	Length (feet)	Price Per Piece	Cost
1.	17	Frame	2 x 3	12		
2.	10	Frame	2 x 4	8		
3.	10	Frame	2 x 6	20		
4.	11	Finish	1 x 12	20		
5.	15	Finish	1 x 8	14		
6.	9	Frame	2 x 10	16		
7.	22	Finish	1 x 3	12		
8.	17	Finish	1 x 6	10		
9.	35	Frame	2 x 6	18		
10.	14	Finish	1 x 12	16		

11. Using the price list on page 475, find the cost of this lumber order. Sales tax is 3½%.

5 - 2 x 10 x 22' Frame lumber .... $
15 - 1 x 8 x 12' Finish " ....
30 - 1 x 4 x 14' Finish " ....
18 - 2 x 6 x 18' Frame " .... ____________

Sub-Total $
Tax $____________
Cost $

12. Apply a 15% discount to this lumber order. Sales tax is 3½%. Use price list on pg. **475**.

30 - 2 x 4 x 18' Frame lumber .... $
35 - 2 x 6 x 18' Frame " ....
42 - 1 x 10 x 18' Finish " .... ________

Sub-Total $
Discount $________
Sub-Total $
Tax $________
Cost $

13. Find the cost of this lumber order. Sales tax is 3½%. Use the price list on page **479**.

54 - 2 x 4 x 18 Frame lumber ....$
39 - 2 x 6 x 20 Frame " ....
28 - 1 x 8 x 10 Finish " ....
32 - 1 x 4 x 12 Finish " .... ________

Sub-Total $
Tax $________
Cost $

14. Apply successive discounts of 15-20 to the following lumber order. Sales tax is 3½%. Use price list on pg. **479**.

75 - 2 x 4 x 12 Frame lumber .... $
100 - 2 x 6 x 20 " " ....
80 - 2 x 10 x 16 " " ....
100 - 1 x 4 x 14 " " ....
50 - 1 x 6 x 10 " " .... ________

Sub-Total $
First Discount $________
Sub-Total $
Second Discount $________
Sub-Total $
Tax $________
Cost $

15. Using the price list on page **483**, find the cost of this order for plywood siding. Sales tax is 3½%.

20 sheets, 3/8" thick plywood .... $
30 " , 5/8" " " ....
15 " , 3/4" " " ....
25 " , 1/2" " " .... ____________

Sub-Total $
Tax $____________

Cost $

16. Apply successive discounts of 5-5, a sales tax of 3½%, and a freight rate of $.3027 per 1000 lb. of siding. The entire order weighs 650,400 lbs. Use the price list on page **483**.

350 sheets, 3/4" Plywood .... $
420 " , 5/8" " ....
250 " , 3/8" " ....
280 " , 1/2" " .... ____________

Sub-Total $
First Discount $____________

Sub-Total $
Second Discount $____________

Sub-Total $
Tax $____________

Sub-Total $
Freight Charge $____________

Cost $

17. Using the price list on page **486**, find the cost of this order. Sales tax is 3½%.

5 Rolls of Tar Paper .... $

½ Keg of Roofing Nails ....

17 Bundles Roof Shingles ....

4 Bundles Cedar Shingles ....

2 - 5 Gallon Pails Mixed Cement ....

8 Rolls Insulation .... ____________

Sub-Total $

Tax $____________

Cost $

18. Find the cost of this order. Use the price list on page **486**. Sales tax is 3½% and a discount of 5% can be applied.

10 Interior Mahogany Doors .... $

8 Louvered Closet Doors ....

8 lbs. #6 Finish Nails ....

18 Cabinet Door Hinges ....

14 Window Locks ....

2 Medicine Cabinets ....

14 Windows .... ____________

Sub-Total $

Discount $____________

Sub-Total $

Tax $____________

Cost $

19. Find the cost of this order. Sales tax is 3½% and a 5% discount can be applied. Use table on page **486**.

40 - 2 x 4 x 8 Frame lumber @ 8¢ per lineal ft. $

20 - 2 x 6 x 12 " " @ 12¢ " " "

18 - 2 x 8 x 18 " " @ 16¢ " " "

12 - 1 x 12 x 16 " " @ 16¢ " " "

18 - 1 x 6 x 10 " " @ 6½¢ " " "

20 - 1 x 3 x 14 " " @ 2½¢ " " "

2 Exterior Pine Doors ....

10 Windows ....

1 Picture Window .... ________

Sub-Total $
Discount $________

Sub-Total $
Tax $________

Cost $

20. Determine the cost of this glass installation. Sales tax is 3½%. Use price list on page **491**.

8 - 32 x 32, 1/8" Window Glass .... $

14 - 14 x 14, 1/8" " " ....

12 - 18 x 12, 1/8" " " ....

6 - 20 x 28, 7/32" " " ....

12 - 30 x 36, 7/32" " " ....

3 - 48 x 60, Polished Plate Glass ....

2 - 48 x 60 Mirrors with Stainless Steel Edges ....

78 Ft. No. 2 Angle Frame ....

78 Ft. Window Casing .... ____________

Sub-Total $
Tax $____________

Cost

21. Determine the cost of installing the following: Sales tax is 3½%. Labor for removal of old glass is $275.

2 - 3 x 7 Aluminum Doors with Hardware .. $
220 ft. Window Casing ....
18 ft. No. 3 Angle Frame ....
3 3/4 ft. Threshold ....
2 - 54 x 68 Polished Plate Glass ....
4 - 30 x 30 Polished Wire Glass .... ____________

$

Use the following supply list to do problems 22 and 23.

Supply List for Job

Amount Ordered for Job	Description of Items	Code No. of Item	Unit Price (each)
120	½" Copper Elbows	2A1	$ .69
120	½" Copper Tees	2B1	.37
28	½" Copper Couplings	2C1	.45
140	½ x 3/8 Copper Elbows	1D4	.72
165	½ x 3/8 Copper Tees	3F5	.80
60	½ x ¼ Copper Tees	6F1	.71
35	½ x 3/8 Copper Reducers	1G5	.58
140	¼" Copper Elbows	3H2	.09
90	¼" Copper Tees	2H3	.11
70	¼" Copper Couplings	1J4	.06

22.

Code No.	Fractional Part of Order	Amount to be Loaded on Truck	Unit Price (each)	Extension
3F5	1/15			$
2A1	1/10			
2C1	2/7			
2H3	2/3			
1G5	1/7			
2B1	5/12			
1J4	2/7			
			Sub-Total	$
			3½% Tax	$
			Cost	$

23.

Code No.	Fractional Part of Order	Amount to be Loaded on Truck	Unit Price (each)	Extension
6F1	1/12			$
3H2	2/7			
1D4	3/7			
2A1	3/10			
2B1	7/12			
1J4	4/7			
2C1	3/7			
			Sub-Total	$
			5% Discount	$
			Sub-Total	$
			3½% Tax	$
			Cost	$

24. Using the list prices on page **505**, determine the cost of this order for chain. A 37½% discount should be applied and a sales tax of 3½%.

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
18103	30		$	$
80130	14			
18083	11			
28410	8			

Sub-Total $
Discount $

Sub-Total $
Tax $

Cost $

25. Using the price list on page **505**, compute the cost of this order for chain. Sales tax is 3½% and a discount of 42½% can be applied.

Code No.	Number of Chains Purchased	Total Feet	Price Per Lineal Ft.	Amount
28610	15		$	$
28510	12			
80329	8			
00752	15			
00746	20			
80297	25			

Sub-Total $
Discount $

Sub-Total $
Tax $

Cost $

In problems 26 and 27, determine the increase or decrease for each tax source, and the total increase or decrease.

26.

Source	Nov. 1964	Nov. 1965	Increase or Decrease
Motor Carrier Road Tax	$ 26,742.19	$ 16,488.98	$
Cigarette Tax	893,462.22	983,077.90	
Corp. Business Tax	1,200,807.21	1,020,774.08	________
		Total Increase or Decrease	$

27.

Source	Apr. 1963	Apr. 1964	Increase or Decrease
Inheritance Tax	$1,207,473.12	$1,292,400.05	$
Unincorp. Bus. Tax	252,007.70	250,789.98	
Railroads	1,943.11	1,709.72	
Conn. Estate Tax	98,403.29	101,667.50	
Insurance Cos.	620,827.21	62,082.72	________
		Total Increase or Decrease	$

Do problems 28 and 29 using the rates on page **514**, and **515**.

28. The Greyhound Bus Co. had a yearly income of $889,400. Compute their unincorporated business tax.

29. The Vigneault Machine Co. manufactures industrial machinery. Compute their unincorporated business tax if sales were $720,800 for a year.

Using the electric rate schedule on page **522**, determine what a customer's bill is if the monthly KWH is:

30. 185 KWH
31. 60 KWH
32. 18 KWH
33. 155
34. 210
35. 295

Using the billing formulas on page **526**, determine the cost of using the following amounts of electricity:

36. 22 KWH
37. 322 KWH
38. 122 KWH
39. 58 KWH
40. 195 KWH
41. 210 KWH

42. Complete the following table of rate reductions. Express per cents to nearest tenth. The per cent decrease is based on the old rate.

KWH Used Per Month	Old Rate	New Rate	Amount of Decrease	Per Cent Decrease
200	$ 7.13	$ 7.09		
250	8.33	8.20		
300	9.53	9.28		
350	10.73	10.38		
400	11.93	11.48		
450	13.13	12.58		
500	14.33	13.86		
600	16.53	16.06		
700	18.73	18.28		
800	20.93	20.58		

Using the gas rates on page **530**, compute the following gas bills.

43. Dial readings are 7036 and 7051.

44. Dial readings are 1998 and 2033.

45. Dial readings are 2079 and 2087.

46. Dial readings are 0372 and 0399.

47. The dial readings on a gas meter were 2025 at the beginning of a month. If 1900 cf of gas is used during the month, what are the dial readings at the end of the month?

48. At the end of June, a gas meter's dials read 3104. What did the dials read on June 1 if 4200 cf of gas was used during the month?

Use the price list on page **534**, for problems 49 and 50.

49. An apartment house requirred 3950 gallons of No. 2 fuel oil for heating. Compute the oil bill.

50. A school used 98,478 gallons of fuel oil during a year. What was the cost of oil?